Dell PowerEdge Command Line Reference Guide for the M I/O Aggregator 9.5(0.0)

Notes, Cautions, and Warnings

NOTE: A NOTE indicates important information that helps you make better use of your computer.

CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

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1

About this Guide

This book provides information about the Dell Networking OS command line interface (CLI) on the Dell PowerEdge M I/O Aggregator.

This book also includes information about the protocols and features found in the Dell Networking OS and on the Dell Networking systems supported by the Dell Networking OS.

References

For more information about your system, refer to the following documents:

- *Dell PowerEdge M I/O Aggregator Configuration Guide*
- *Dell PowerEdge M I/O Aggregator Getting Started Guide*
- *Release Notes for the Dell PowerEdge M I/O Aggregator*

Objectives

This book is intended as a reference guide for the Aggregator CLI commands, with detailed syntax statements, along with usage information and sample output.

This guide contains an Appendix with a list of the request for comment (RFCs) and management information base files (MIBs) supported.

NOTE: For more information about when to use the CLI commands, refer to the *Dell PowerEdge M I/O Aggregator Configuration Guide* for your system.

Audience

This book is intended for system administrators who are responsible for configuring or maintaining networks. This guide assumes that you are knowledgeable in Layer 2 and Layer 3 networking technologies.

Conventions

This book uses the following conventions to describe command syntax.

`Keyword`	Keywords are in Courier font and must be entered in the CLI as listed.
parameter	Parameters are in italics and require a number or word to be entered in the CLI.
{X}	Keywords and parameters within braces must be entered in the CLI.
[X]	Keywords and parameters within brackets are optional.
x|y	Keywords and parameters separated by a bar require you to choose one option.
x||y	Keywords and parameters separated by a double bar allows you to choose any or all of the options.

2

Before You Start

By following the instructions in the *Dell PowerEdge M I/O Aggregator Getting Started Guide* that is shipped with the product, you install the Aggregator in a Dell PowerEdge M1000e Enclosure.

The Aggregator installs with zero-touch configuration. After you power it on, an Aggregator boots up with default settings and auto-configures with software features enabled. This chapter describes the default settings and software features that are automatically configured at startup. Use the tasks described in the other chapters to reconfigure the Aggregator for customized network operation.

Operational Modes

The I/O Aggregator supports four operational modes. Select the operational mode that meets your deployment needs. To enable a new operational mode, reload the switch.

- Standalone mode — stack-unit unit iom-mode standalone. This is the default mode for IOA. It is fully automated zero-touch mode that allows you to configure VLAN memberships. (Supported in CMC)
- Programmable MUX mode (PMUX) — stack-unit unit iom-mode programmable-mux. Select this mode to configure PMUX mode CLI commands.
- Stacking mode — stack-unit unit iom-mode stacking. Select this mode to stack up to 6 IOA stack units as a single logical switch. The stack units can be in the same or on different chassis. This is a low-touch mode where all configuration except VLAN membership is automated. To enable VLAN, you must configure it. In this operational mode, base module links are dedicated to stacking.
- Virtual Link Trunking mode (VLT) — stack-unit unit iom-mode vlt. Select this mode to multi-home server interfaces to different IOA modules. This is a low-touch mode where all configuration except VLAN membership is automated. To enable VLAN, you must configure it. In this mode, base module links are dedicated to VLT interconnect.

For more information, refer to the *Dell PowerEdge M I/O Aggregator Configuration Guide*.

Default Settings

The I/O Aggregator provides zero-touch configuration with the following default configuration settings:

- Default user name (**root**)
- Password (**calvin**)
- VLAN (**vlan1**) and IP address for in-band management (**DHCP-assigned**)
- IP address for out-of-band (OOB) management (**DHCP-assigned**)
- Read-only SNMP community name (**public**)
- Broadcast storm control (**enabled**)
- Unregistered Multicast Packets flooding (**enabled)**

- IGMP snooping in all VLANs except the default VLAN (**enabled**)
- VLAN configuration (**all ports belong to all VLANs**)

You can change any of these default settings using the CLI. Refer to the appropriate chapter for details.

NOTE: You can also change many of the default settings using the chassis management controller (CMC) interface. For information about how to access the CMC to configure an Aggregator, refer to the *Dell PowerEdge M1000e Enclosure Hardware Owner's Manual* or *Dell Chassis Management Controller (CMC) User's Guide* on the Dell Support website at http://support.dell.com/support/edocs/systems/pem/en/index.htm.

Other Auto-Configured Settings

After the Aggregator powers on, it auto-configures and is operational with software features enabled, including:

- VLANs: All ports are configured as members of all (4094) VLANs. All VLANs are up and can send or receive layer 2 traffic. For more information, refer to VLANs.
- Data Center Bridging Capability Exchange Protocol (DCBX)
- Fibre Channel over Ethernet (FCoE) connectivity
- FCoE Initiation Protocol (FIP) snooping
- Hybrid ports: Ports are administratively up and auto-configured to operate as hybrid ports to transmit tagged and untagged VLAN traffic.
- iSCSI optimization
- IGMP snooping
- Jumbo frames: Ports are set to a maximum MTU of 12,000 bytes by default.
- Link aggregation: All uplink ports are configured in a single LAG (LAG 128).
- Link Layer Discovery Protocol (LLDP): Enabled on all ports.
- Link tracking: Enables server-facing links to be brought up only if the uplink port-channel (LAG 128) is up.
- Stacking: Stacking is supported only on the 40GbE ports on the base module. A single stack is limited to six Aggregators in the same chassis. Up to three stacks are supported in an M1000e chassis. To configure a switch stack, you must use the CLI. For more information, refer to Stacking Commands.

DCB Support

DCB enhancements for data center networks are supported to eliminate packet loss and provision links with required bandwidth.

The Aggregator provides zero-touch configuration for DCB. The Aggregator auto-configures DCBX port roles to match the DCBX configuration in the ToR switches to which it connects through its uplink ports.

The Aggregator supports DCB only in standalone mode and not in the stacking mode.

FCoE Connectivity

Many data centers use Fibre Channel (FC) in storage area networks (SANs). Fibre Channel over Ethernet (FCoE) encapsulates Fibre Channel frames over Ethernet networks.

On an Aggregator, the internal ports support FCoE connectivity and connect to the converged network adapter (CNA) in blade servers. FCoE allows Fibre Channel to use 10-Gigabit Ethernet networks while preserving the Fibre Channel protocol.

The Aggregator also provides zero-touch configuration for FCoE configuration. The Aggregator auto-configures to match the FCoE settings used in the ToR switches to which it connects through its uplink ports.

iSCSI Operation

Support for iSCSI traffic is turned on by default when the Aggregator powers up. No configuration is required.

When the Aggregator powers up, it monitors known TCP ports for iSCSI storage devices on all interfaces. When a session is detected, an entry is created and monitored as long as the session is active.

The Aggregator also detects iSCSI storage devices on all interfaces and auto-configures to optimize performance. Performance optimization operations, such as Jumbo frame size support, STP port-state fast, and disabling of storm control on interfaces connected to an iSCSI storage device, are applied automatically.

CLI configuration is necessary only when the configuration includes iSCSI storage devices that cannot be automatically detected and when non-default QoS handling is required.

Link Aggregation

In Standalone, VLT, and Stacking modes, all uplink ports are configured in a single LAG (LAG 128). There can be multiple uplink LAGs in programmable-mux mode. Server-facing ports are auto-configured as part of link aggregation groups if the corresponding server is configured for LACP-based NIC teaming. Static LAGs are supported in PUX mode.

NOTE: The recommended LACP timeout is Long-Timeout mode.

Link Tracking

By default, all server-facing ports are tracked by the operational status of the uplink LAG. If the uplink LAG goes down, the Aggregator loses its connectivity and is no longer operational; all server-facing ports are brought down.

NOTE: If installed servers do not have connectivity to a ToR switch, check the Link Status LED of uplink ports on the Aggregator. If all LEDs are ON, check the LACP configuration on the ToR switch that is connected to the Aggregator to ensure the LACP is correctly configured.

VLANs

By default, all Aggregator ports belong to all 4094 VLANs and are members of untagged VLAN 1. You can use the CLI or CMC interface to configure only the required VLANs on a port.

When you configure VLANs on server-facing interfaces (ports 1 to 32), you can assign VLANs to a port or a range of ports by entering the vlan tagged or vlan untagged commands in interface configuration mode; for example:

```
Dell(conf)# interface tengigabitethernet 0/2 - 4
Dell(conf-if-range-te-0/2-4)# vlan tagged 5,7,10-12
Dell(conf-if-range-te-0/2-4)# vlan untagged 3
```

NOTE: You can also use the CMC interface to configure VLANs.

Uplink LAG

The tagged VLAN membership of the uplink LAG is automatically configured based on the tagged and untagged VLAN configuration of all server-facing ports (ports 1 to 32).

The untagged VLAN used for the uplink LAG is always the default VLAN.

Server-Facing LAGs

The tagged VLAN membership of a server-facing LAG is automatically configured based on the server-facing ports that are members of the LAG.

The untagged VLAN of a server-facing LAG is configured based on the untagged VLAN to which the lowest numbered server-facing port in the LAG belongs.

NOTE: Dell Networking recommends that you configure the same VLAN membership on all LAG member ports.

Stacking Mode

When you configure an Aggregator to operate in stacking mode (See "Configuring and Bringing Up a Stack" in the Dell Networking Configuration Guide for the M I/O Aggregator), VLANs are reconfigured as follows:

If an Aggregator port belonged to all 4094 VLANs in standalone mode (default), all VLAN membership is removed and the port is assigned only to default VLAN 1. You must configure additional VLAN membership as necessary.

If you had manually configured an Aggregator port to belong to one or more VLANs (non-default) in standalone mode, the VLAN configuration is retained in stacking mode only on the master switch

When you reconfigure an Aggregator from stacking to standalone mode:

Aggregator ports that you manually configured for VLAN membership in stacking mode retain their VLAN configuration in standalone mode.

To restore the default auto-VLAN mode of operation (in which all ports are members of all 4094 VLANs) on a port, enter the auto vlan command; for example:

```
Dell(conf)# interface tengigabitethernet 0/2
Dell(conf-if-te-0/2)# auto vlan
```

To get the default standalone mode configurations:

1. Delete the **startup-config** file and reboot the system.

2. Restore to factory default settings.
3. Configure **auto vlan** command on all the server ports.

Where to Go From Here

You can customize the Aggregator for use in your data center network as necessary. To perform additional switch configuration, do one of the following:

- For remote out-of-band management, enter the OOB management interface IP address into a Telnet or SSH client and log in to the switch using the user ID and password to access the CLI.
- For local management using the CLI, use the attached console connection.
- For remote in-band management from a network management station, enter the VLAN IP address of the management port and log in to the switch to access the CLI.

If you installed the Aggregator in a stack, you can configure additional settings for switch stacking

In case of a Dell Networking OS upgrade, you can check to see that an Aggregator is running the latest Dell Networking OS version by entering the show version command. To download a Dell Networking OS version, go to http://support.dell.com.

Refer to the appropriate chapter for detailed information on how to configure specific software settings.

3

CLI Basics

This chapter describes the command line interface (CLI) structure and command modes. The Dell operating system commands are in a text-based interface that allows you to use the launch commands, change command modes, and configure interfaces and protocols.

Accessing the Command Line

When the system boots successfully, you are positioned on the command line in EXEC mode and not prompted to log in. You can access the commands through a serial console port or a Telnet session. When you Telnet into the switch, you are prompted to enter a login name and password.

Example

```
telnet 172.31.1.53
Trying 172.31.1.53...
Connected to 172.31.1.53.
Escape character is '^]'.
Login: username
Password:
Dell>
```

After you log in to the switch, the prompt provides you with the current command-level information. For example:

Prompt	CLI Command Mode
Dell>	EXEC
Dell#	EXEC Privilege
Dell(conf)#	CONFIGURATION

NOTE: For a list of all the command mode prompts, refer to the Command Modes Modes section.

Multiple Configuration Users

When a user enters CONFIGURATION mode and another user is already in CONFIGURATION mode, the Dell operating system generates an alert warning message similar to the following:

```
Dell#conf

% Warning: The following users are currently configuring the system:

User "" on line console0
User "admin" on line vty0 ( 123.12.1.123 )
User "admin" on line vty1 ( 123.12.1.123 )
```

```
User "Irene" on line vty3 ( 123.12.1.321 )
Dell#conf
```

When another user enters CONFIGURATION mode, the Dell Networking OS sends a message similar to the following:

```
% Warning: User "admin" on line vty2 "172.16.1.210" is in configuration
```

In this case, the user is “admin” on vty2.

Navigating the CLI

The Dell Networking OS displays a CLI prompt comprised of the host name and CLI mode.

- Host name is the initial part of the prompt and is “Dell” by default. You can change the host name with the `hostname` command.
- CLI mode is the second part of the prompt and reflects the current CLI mode. For a list of the Dell Networking OS command modes, refer to the command mode list in the Accessing the Command Line section.

The CLI prompt changes as you move up and down the levels of the command structure. Starting with CONFIGURATION mode, the command prompt adds modifiers to further identify the mode. For more information about command modes, refer to the Command Modes section.

Prompt	CLI Command Mode
Dell>	EXEC
Dell#	EXEC Privilege
Dell(conf)#	CONFIGURATION
Dell(conf-if-te-0/0)#	INTERFACE
Dell(conf-if-vl-1)#	
Dell(conf-if-ma-0/0)#	
Dell(conf-if-range)#	
Dell(conf-line-console)#	LINE
Dell(conf-line-vty)#	
Dell(conf-mon-sess)#	MONITOR SESSION

Obtaining Help

As soon as you are in a command mode there are several ways to access help.

To obtain a list of keywords at any command mode:	Type a `?` at the prompt or after a keyword. There must always be a space before the `?`.
To obtain a list of keywords with a brief functional description:	Type `help` at the prompt.
To obtain a list of available options:	Type a keyword and then type a space and a `?`.
To obtain a list of partial keywords using a partial keyword:	Type a partial keyword and then type a `?`.

Example	The following is an example of typing `ip ?` at the prompt:
	
	`Dell(conf)#ip ?`
	`igmp  Internet Group Management Protocol`
	`route  Establish static routes`
	`telnet  Specify telnet options`

When entering commands, you can take advantage of the following timesaving features:

- The commands are not case-sensitive.
- You can enter partial (truncated) command keywords. For example, you can enter `int tengig int` for the `interface tengigabitethernet interface` command.
- To complete keywords in commands, use the TAB key.
- To display the last enabled command, use the up Arrow key.
- To erase the previous character, use either the Backspace key or Delete key.
- To navigate left or right in the Dell Networking OS command line, use the left and right Arrow keys.

The shortcut key combinations at the Dell Networking OS command line are as follows:

Key Combination	Action
CNTL-A	Moves the cursor to the beginning of the command line.
CNTL-B	Moves the cursor back one character.
CNTL-D	Deletes the character at the cursor.
CNTL-E	Moves the cursor to the end of the line.
CNTL-F	Moves the cursor forward one character.
CNTL-I	Completes a keyword.

Key Combination	Action
CNTL-K	Deletes all the characters from the cursor to the end of the command line.
CNTL-L	Re-enters the previous command.
CNTL-N	Returns to the more recent commands in the history buffer after recalling commands with Ctrl-P or the up Arrow key.
CNTL-P	Recalls commands, beginning with the last command.
CNTL-U	Deletes the line.
CNTL-W	Deletes the previous word.
CNTL-X	Deletes the line.
CNTL-Z	Comes back to EXEC mode from any CONFIGURATION mode.
Esc B	Moves the cursor back one word.
Esc F	Moves the cursor forward one word.
Esc D	Deletes all the characters from the cursor to the end of the word.

Using the Keyword no Command

To disable, delete or return to default values, use the `no` form of the commands.

For most commands, if you type the keyword `no` in front of the command, you disable that command or delete it from the running configuration. In this guide, the `no` form of the command is described in the Syntax portion of the command description. For example:

Syntax	`no {boot | default | enable | ftp-server | hardware | hostname | ip | line | logging | monitor | service | io-aggregator broadcast storm-control | snmp-server | username}`
Defaults	None
Command Modes	CONFIGURATION
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.

Filtering show Commands

To find specific information, display certain information only or begin the command output at the first instance of a regular expression or phrase, you can filter the display output of a `show` command.

When you execute a `show` command, and then enter a pipe (|), one of the following parameters, and a regular expression, the resulting output either excludes or includes those parameters.

NOTE: The Dell Networking OS accepts a space before or after the pipe, no space before or after the pipe, or any combination. For example: `Dell#command | grep gigabit |except regular-expression | find regular-expression`.

except	displays only the text that does not match the pattern (or regular expression)
find	searches for the first occurrence of a pattern
grep	displays text that matches a pattern.
no-more	does not paginate the display output
save	copies the output to a file for future use

The grep command option has an ignore-case sub-option that makes the search case-insensitive. For example, the commands:

- show run | grep Ethernet returns a search result with instances containing a capitalized "Ethernet," such as interface TenGigabitEthernet 0/1.
- show run | grep ethernet does not return the search result above because it only searches for instances containing a non-capitalized "ethernet".
- show run | grep Ethernet ignore-case returns instances containing both "Ethernet" and "ethernet".

Displaying All Output

To display the output all at once (not one screen at a time), use the `no-more` option after the pipe. This operation is similar to the `terminal length screen-length` command except that the `no-more` option affects the output of just the specified command. For example:

```
Dell#show running-config|no-more
```

Filtering the Command Output Multiple Times

You can filter a single command output multiple times. To filter a command output multiple times, place the `save` option as the last filter. For example:

```
Dell# command | grep regular-expression | except regular-expression | grep
other-regular-expression | find regular-expression | no-more | save
```

Command Modes

To navigate and launch various CLI modes, use specific commands. Navigation to these modes is described in the following sections.

EXEC Mode

When you initially log in to the switch, by default, you are logged in to EXEC mode. This mode allows you to view settings and enter EXEC Privilege mode, which is used to configure the device.

When you are in EXEC mode, the > prompt is displayed following the host name prompt, which is "Dell" by default. You can change the host name prompt using the `hostname` command.

NOTE: Each mode prompt is preceded by the host name.

EXEC Privilege Mode

The `enable` command accesses EXEC Privilege mode. If an administrator has configured an "Enable" password, you are prompted to enter it.

EXEC Privilege mode allows you to access all the commands accessible in EXEC mode, plus other commands, such as to clear address resolution protocol (ARP) entries and IP addresses. In addition, you can access CONFIGURATION mode to configure interfaces, routes and protocols on the switch. While you are logged in to EXEC Privilege mode, the # prompt displays.

CONFIGURATION Mode

In EXEC Privilege mode, use the `configure` command to enter CONFIGURATION mode and configure routing protocols and access interfaces.

To enter CONFIGURATION mode:

1. Verify that you are logged in to EXEC Privilege mode.
2. Enter the `configure` command. The prompt changes to include (conf).

From this mode, you can enter INTERFACE mode by using the `interface` command.

INTERFACE Mode

To configure interfaces or IP services on those interfaces, use INTERFACE mode. An interface can be physical (for example, a TenGigabit Ethernet port) or virtual (for example, the VLAN interface).

To enter INTERFACE mode:

1. Verify that you are logged in to CONFIGURATION mode.
2. Enter the `interface` command and then enter an interface type and interface number that is available on the switch.

The prompt changes to include the designated interface and slot/port number. For example:

Prompt	Interface Type
Dell(conf-if-te-0/1)#	Ten-Gigabit Ethernet interface then slot/port information
Dell(conf-if-vl-1)#	VLAN Interface then VLAN number (range 1–4094)
Dell(conf-if-ma-0/1)#	Management Ethernet interface then slot/port information
Dell(conf-if-range)#	Designated interface range (used for bulk configuration)

LINE Mode

To configure the console or virtual terminal parameters, use LINE mode.

To enter LINE mode:

1. Verify that you are logged in to CONFIGURATION mode.
2. Enter the `line` command. Include the keywords `console` or `vty` and their line number available on the switch. The prompt changes to include (`config-line-console`) or (`config-line-vty`).

You can exit this mode by using the `exit` command.

MONITOR SESSION Mode

In CONFIGURATION mode, use the `monitor session` command to enter MONITOR SESSION mode and configure port monitoring.

To enter MONITOR SESSION mode:

1. Verify that you are logged in to CONFIGURATION mode.
2. Use the `monitor session` command. Include the monitor session ID. The prompt changes to include (`conf-mon-sess`).

You can return to CONFIGURATION mode by using the `exit` command.

PROTOCOL LLDP Mode

In CONFIGURATION mode, use the `protocol lldp` command to enter PROTOCOL LLDP mode and configure the LLDP protocol.

To enter PROTOCOL LLDP mode:

1. Verify that you are logged in to CONFIGURATION mode.
2. Enter the `protocol lldp` command. The prompt changes to include `Dell(config-lldp)`.

You can return to CONFIGURATION mode by using the `exit` command.

4

File Management

This chapter contains commands needed to manage the configuration files and includes other file management commands.

The commands in this chapter are supported by the Dell Networking OS.

boot system gateway

Specify the IP address of the default next-hop gateway for the management subnet.

Syntax	`boot system gateway` *ip-address*	
Parameters	***ip-address***	Enter an IP address in dotted decimal format.
Command Modes	CONFIGURATION	
Command History	**Version 9.4(0.0)**	Supported on the FN I/O aggregator.
Usage Information	Saving the address to the startup configuration file preserves the address in NVRAM in case the startup configuration file is deleted.	

boot system stack-unit

Specify the location of the Dell Networking OS image to be used to boot the system.

Syntax	`boot system stack-unit <`*0-5* `| all> {default | primary | secondary}`	
Parameters	**0-5**	Enter the stack member unit identifier of the stack member.
	all	Enter the keyword `all` to set the primary, secondary, and default images for the system.
	default	Enter the keyword `default` to set the default image path for the system.
	primary	Enter the keyword `primary` to set the primary image path for the system.

	secondary	Enter the keyword `secondary` to set the secondary image path for the system.
Command Modes	CONFIGURATION	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.
Usage Information	The system first attempts to load the image from the primary path. If it fails to boot, the system tries to load the image from the secondary path and if that also fails, the system loads the default image.	

cd

Change to a different working directory.

Syntax	`cd` *directory*	
Parameters	***directory***	(OPTONAL) Enter one of the following: • `flash`: (internal Flash) or any sub-directory • `usbflash`: (external Flash) or any sub-directory
Command Modes	EXEC Privilege	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

copy

Copy one file to another location. The Dell Networking OS supports IPv4 addressing for FTP, TFTP, and SCP (in the *hostip* field).

Syntax	`copy` *source-file-url destination-file-url*	
Parameters	***file-url***	Enter the following location keywords and information: • To copy a file from the internal FLASH, enter `flash://` then the filename. • To copy the running configuration, enter the keywords `running-config`. • To copy the startup configuration, enter the keywords `startup-config`.

- To copy a file on the external FLASH, enter `usbflash://` then the filename.

Command Modes EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

The Dell Networking OS supports a maximum of 100 files, at the root directory level, on both the internal and external Flash.

The `usbflash` commands are supported. For a list of approved USB vendors, refer to the *Dell Networking OS Release Notes*.

When copying a file to a remote location (for example, using Secure Copy [SCP]), enter only the keywords and Dell Networking OS prompts you for the rest of the information.

For example, when using SCP, you can enter the `copy running-config scp:` command. The running-config is the source and the target is specified in the ensuing prompts. Dell Networking OS prompts you to enter any required information, as needed for the named destination — remote destination, destination filename, user ID and password, and so forth.

When you use the `copy running-config startup-config` command to copy the running configuration (the startup configuration file amended by any configuration changes made because the system was started) to the startup configuration file, Dell Networking OS creates a backup file on the internal flash of the startup configuration.

The Dell Networking OS supports copying the running-configuration to a TFTP server or to an FTP server:

- `copy running-config tftp:`
- `copy running-config ftp:`

In the `copy scp: flash:` example, specifying SCP in the first position indicates that the target to specify in the ensuing prompts. Entering `flash:` in the second position means that the target is the internal Flash. In this example, the source is on a secure server running SSH, so you are prompted for the UDP port of the SSH server on the remote host.

Example (running-config scp:)

```
Dell#copy running-config scp:
Address or name of remote host []: 10.10.10.1
Port number of the server [22]: 99
Destination file name [startup-config]: old_running
User name to login remote host: sburgess
Password to login remote host:

Password to login remote host? dilling
```

Example (copy scp:)

```
Dell#copy scp: flash:
Address or name of remote host []: 10.11.199.134
Port number of the server [22]: 99
Source file name []: test.cfg
User name to login remote host: admin
Password to login remote host:
Destination file name [test.cfg]: test1.cfg
```

Related Commands

cd — Changes the working directory.

copy running-config startup-config

Copy running configuration to the startup configuration.

Syntax

```
copy running-config startup-config {duplicate}
```

Command Modes

EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

This command is useful for quickly making a change configuration on one chassis available on external flash to move it to another chassis.

delete

Delete a file from the flash. After deletion, files cannot be restored.

Syntax

```
delete flash: ([flash://]filepath) usbflash
([usbflash://]filepath)
```

Parameters

flash-url	Enter the following location and keywords: • For a file or directory on the internal Flash, enter `flash://` then the filename or directory name. • For a file or directory on an external USB drive, enter `usbflash://` then the filename or directory name.
no-confirm	(OPTIONAL) Enter the keywords `no-confirm` to specify that the Dell Networking OS does not require user input for each file prior to deletion.

Command Modes

EXEC Privilege

Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator

dir

Displays the files in a file system. The default is the current directory.

Syntax `dir [filename | directory name:]`

Parameters

filename* | *directory name:	(OPTIONAL) Enter one of the following: • For a file or directory on the internal Flash, enter `flash://` then the filename or directory name. • For a file or directory on an external USB drive, enter `usbflash://` then the filename or directory name.

Command Modes EXEC Privilege

Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

Example

```
Dell#dir
Directory of flash:

1  drwx  4096      Jan 01 1980 00:00:00 +00:00 .
2  drwx  2048      Mar 06 2010 00:36:21 +00:00 ..
3  drwx  4096      Feb 25 2010 23:32:50 +00:00 TRACE_LOG_DIR
4  drwx  4096      Feb 25 2010 23:32:50 +00:00 CORE_DUMP_DIR
5  d---  4096      Feb 25 2010 23:32:50 +00:00 ADMIN_DIR
6  -rwx  720969768 Mar 05 2010 03:25:40 +00:00 6gb
7  -rwx  4260      Mar 03 2010 22:04:50 +00:00 prem-23-5-12
8  -rwx  31969685  Mar 05 2010 17:56:26 +00:00
DellS-XL-8-3-16-148.bin
9  -rwx  3951      Mar 06 2010 00:36:18 +00:00 startup-config

flash: 2143281152 bytes total (1389801472 bytes free)
Dell#
```

Related Commands cd — Changes the working directory.

format flash

Erase all existing files and reformat the filesystem in the internal flash memory. After the filesystem is formatted, files cannot be restored.

Syntax `format {flash: | usbflash:}`

Defaults	**flash memory**
Command Modes	EXEC Privilege
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.
Usage Information	You must include the colon (:) when entering this command. **CAUTION: This command deletes all files, including the startup configuration file. So, after executing this command, consider saving the running config as the startup config (use the `write memory` command or `copy run start` command).**
Related Commands	copy – copies the current configuration to either the startup-configuration file or the terminal. show file – displays the contents of a text file in the local filesystem. show file-systems – displays information about the file systems on the system.

HTTP Copy via CLI

Copy one file to another location. Dell Networking OS supports IPv4 and IPv6 addressing for FTP, TFTP, and SCP (in the *hostip* field).

This feature is supported on S6000 Z9000 S4810 S4820T platform.

Syntax

```
copy http://10.16.206.77/sample_file flash://sample_filecopy
flash://sample_file http://10.16.206.77/sample_file
```

You can copy from the server to the switch and vice-versa.

Parameters

`copy http:`	Address or name of remote host []: 10.16.206.77
`flash:`	Port number of the server [80]:
	Source file name []: sample_file
	User name to login remote host: x
	Password to login remote host:
	Destination file name [sample_file]:

Defaults None.

Command Modes	EXEC	
Command History	**Version 9.3(0.1)**	Introduced on the S6000, Z9000, S4810, and S4820T.
Example	`copy http://admin:admin123@10.16.206.77/sample_file flash://sample_file`	
Related Commands	`copy ftp:flash` Copy files from FTP server to switch	

logging coredump stack-unit

Enable the coredump.

Syntax	`logging coredump stack-unit all`	
Command Modes	CONFIGURATION	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.
Usage Information	The Kernel core dump can be large and may take up to five to 30 minutes to upload. The Dell Networking OS does not overwrite application core dumps so delete them as necessary to conserve space on the flash; if the flash is out of memory, the coredump is aborted. The Dell Networking OS completes the coredump process and waits until the upload is complete before rebooting the system.	

pwd

Display the current working directory.

Syntax	`pwd`	
Command Modes	EXEC Privilege	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

Example	`Dell#pwd`
	`flash:`
	`Dell#`	

Related Commands	cd – changes the directory.

rename

Rename a file in the local file system.

Syntax	`rename` *`url url`*	
Parameters	***url***	Enter the following keywords and a filename: • For a file on the internal Flash, enter `flash://` then the filename. • For a file on an external USB drive, enter `usbflash://` then the filename.
Command Modes	EXEC Privilege	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

restore factory-defaults

Restore factory defaults.

Syntax	`restore factory-defaults stack-unit {0-5 | all} {clear-all | nvram}`	
Parameters	**factory-defaults**	Return the system to its factory default mode.
	0-5	Enter the stack member unit identifier to restore only the mentioned stack-unit.
	all	Enter the keyword `all` to restore all units in the stack.
	clear-all	Enter the keywords `clear-all` to reset the NvRAM and the system startup configuration.
	nvram	Enter the keyword `nvram` to reset the NvRAM only.
Command Modes	EXEC Privilege	
Command History	**Version 8.3.17.1**	Supported on the M I/O Aggregator.

Usage Information

Restoring factory defaults deletes the existing startup configuration and all persistent settings (stacking, fanout, and so forth).

When restoring all units in a stack, all the units in the stack are placed into stand-alone mode.

When restoring a single unit in a stack, that unit placed in stand-alone mode. No other units in the stack are affected.

When restoring units in stand-alone mode, the units remain in stand-alone mode after the restoration. After the restore is complete, the units power cycle immediately.

CAUTION: There is no undo for this command.

Example (all stack units)

```
Dell#restore factory-defaults stack-unit all clear-all
************************************************************
* Warning - Restoring factory defaults will delete the
existing *
* startup-config and all persistent settings (stacking,
fanout, etc.)*
* All the units in the stack will be split into standalone
units. *
* After restoration the unit(s) will be powercycled
immediately. *
* Proceed with caution ! *
************************************************************
Proceed with factory settings? Confirm [yes/no]:yes
-- Restore status --
Unit Nvram      Config
------------------------
0    Success    Success
1    Success    Success
2    Success    Success
3    Not present
4    Not present
5    Not present
Power-cycling the unit(s).
Dell#
```

Example (single stack)

```
Dell#restore factory-defaults stack-unit 0 clear-all
************************************************************
* Warning - Restoring factory defaults will delete the
existing *
* startup-config and all persistent settings (stacking,
fanout, etc.)*
* After restoration the unit(s) will be powercycled
immediately. *
* Proceed with caution ! *
************************************************************
Proceed with factory settings? Confirm [yes/no]:yes
-- Restore status --
Unit Nvram    Config
------------------------
0    Success  Success
Power-cycling the unit(s).
Dell#
```

Example (NvRAM all stack units)

```
Dell#restore factory-defaults stack-unit all nvram
************************************************************
* Warning - Restoring factory defaults will delete the
existing *
* persistent settings (stacking, fanout, etc.) *
* All the units in the stack will be split into standalone
units. *
* After restoration the unit(s) will be powercycled
immediately. *
* Proceed with caution ! *
************************************************************
Proceed with factory settings? Confirm [yes/no]:yes
-- Restore status --
Unit Nvram      Config
------------------------
0    Success
1    Success
2    Success
3    Not present
4    Not present
5    Not present
Power-cycling the unit(s).
Dell#
```

Example (NvRAM, single unit)

```
Dell#restore factory-defaults stack-unit 1nvram
************************************************************
* Warning - Restoring factory defaults will delete the
existing *
* persistent settings (stacking, fanout, etc.) *
* After restoration the unit(s) will be powercycled
immediately. *
* Proceed with caution ! *
************************************************************
Proceed with factory settings? Confirm [yes/no]:yes
-- Restore status --
Unit Nvram   Config
------------------------
1    Success
Power-cycling the unit(s).
Dell#
```

show boot system

Displays information about boot images currently configured on the system.

Syntax `show boot system stack-unit {0-5 | all}`

Parameters

0–5	Enter this information to display the boot image information of only the entered stack-unit.
all	Enter the keyword `all` to display the boot image information of all the stack-units in the stack.

Defaults none

Command Modes	• EXEC • EXEC Privilege
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.

Example	`Dell#show boot system stack-unit all`
	`Current system image information in the system:`
	`==========================================`
	`Type Boot Type A B`
	`------------------------------------------`
	`Stack-unit 0 is not present.`
	`Stack-unit 1 DOWNLOAD BOOT 9-1-0-218 9-1-0-202`
	`Stack-unit 2 is not present.`
	`Stack-unit 3 is not present.`
	`Stack-unit 4 is not present.`
	`Stack-unit 5 is not present.`

show file

Displays contents of a text file in the local filesystem.

Syntax	`show file` *url*
Parameters	***url*** Enter one of the following: • For a file on the internal Flash, enter `flash://` then the filename. • For a file on the external Flash, enter `usbflash://` then the filename.
Command Modes	EXEC Privilege
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.

Example	`Dell#show file flash://startup-config`
	`! Version E8-3-17-38`
	`boot system stack-unit 1 primary tftp://10.11.9.21/dv-m1000e-2-b2`
	`boot system stack-unit 1 default system: A:`
	`boot system gateway 10.11.209.62`
	`!`
	`hostname FTOS`
	`--More--`
	`Dell#`

Related Commands	format flash — erases all the existing files and reformats the filesystem in the internal flash memory.

show file-systems — displays information about the file systems on the system.

show file-systems

Displays information about the file systems on the system.

Syntax

```
show file-systems
```

Command Modes

EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Example

```
Dell#show file-systems
Size(b)      Free(b)     Feature Type       Flags Prefixes
 2143281152   836874240  FAT32   USERFLASH  rw    flash:
          -           -      -   network    rw    ftp:
          -           -      -   network    rw    tftp:
          -           -      -   network    rw    scp:
Dell#
```

Command Fields

Field	Description
size(b)	Lists the size in bytes of the storage location. If the location is remote, no size is listed.
Free(b)	Lists the available size in bytes of the storage location. If the location is remote, no size is listed.
Feature	Displays the formatted DOS version of the device.
Type	Displays the type of storage. If the location is remote, the word `network` is listed.
Flags	Displays the access available to the storage location. The following letters indicate the level of access: • r = read access • w = write access
Prefixes	Displays the name of the storage location.

Related Commands

format flash – erases all the existing files and reformats the filesystem in the internal flash memory.

show file – displays the contents of a text file in the local filesystem.

show os-version

Displays the release and software image version information of the image file specified.

Syntax `show os-version [file-url]`

Parameters

file-url	(OPTIONAL) Enter the following location keywords and information: • For a file on the internal Flash, enter `flash://` then the filename. • For a file on an FTP server, enter `ftp://user:password@hostip/filepath`. • For a file on a TFTP server, enter `tftp://hostip/filepath`. • For a file on the external Flash, enter `usbflash://filepath` then the filename.

Defaults none

Command Modes EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

NOTE: A filepath that contains a dot (.) is not supported.

Example

```
Dell#show os-version

RELEASE IMAGE INFORMATION :
------------------------------------------------------------------
Platform         Version        Size           ReleaseTime
IOM-Series: XL   8-3-17-38    31603078    Jul 19 2012 06:02:28

TARGET IMAGE INFORMATION :
------------------------------------------------------------------
Type         Version                   Target    checksum
runtime       8-3-17-38        Control Processor      passed

CPLD IMAGE INFORMATION :
------------------------------------------------------------------
Card                   CPLD Name   Version
Stack-unit 1     IOM SYSTEM CPLD         6
Dell#
```

show running-config

Displays the current configuration and display changes from the default values.

Syntax

```
show running-config [entity] [configured] [status]
```

Parameters

entity (OPTIONAL) To display that entity's current (non-default) configuration, enter one of the following keywords:

NOTE: If you did not configure anything for that entity, nothing displays and the prompt returns.

boot	for the current boot configuration
ftp	for the current FTP configuration
igmp	for the current IGMP configuration
interface	for the current interface configuration
line	for the current line configuration
lldp	for the current lldp configuration
logging	for the current logging configuration
management-route	for the current Management port forwarding configuration
monitor	for the current Monitor configuration
snmp	for the current SNMP configuration
uplink-state-group	for the uplink state group configuration
users	for the current users configuration

configured (OPTIONAL) Enter the keyword `configured` to display line card interfaces with non-default configurations only.

status (OPTIONAL) Enter the keyword `status` to display the checksum for the running configuration and the start-up configuration.

Command Modes EXEC Privilege

Command History

Version 9.4(0.0)	Supported on the FN I/O aggregator.

Example

```
Dell#show running-config
Current Configuration ...
! Version 9-4(0-180)
!
boot system stack-unit 0 primary tftp://10.11.8.12/dv-ci-stomp-
tc-1-a1
!
redundancy auto-synchronize full
!
```

```
hostname Dell
...
```

Example

```
Dell#show running-config status

running-config bytes 5063, checksum 0xF6F801AC
startup-config bytes 4835, checksum 0x764D3787
Dell#
```

Usage Information

The `status` option allows you to display the size and checksum of the running configuration and the startup configuration.

show version

Displays the current Dell Networking OS version information on the system.

Syntax

```
show version
```

Command Modes

EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Example

```
Dell#show version
Dell Force10 Real Time Operating System Software
Dell Force10 Operating System Version: 1.0
Dell Force10 Application Software Version: E8-3-17-38
Copyright (c) 1999-2012 by Dell Inc. All Rights Reserved.
Build Time: Thu Jul 19 05:59:59 PDT 2012
Build Path: /sites/sjc/work/swsystems01-2/ravisubramani/
ravis-8317/SW/SRC/
Cp_src/Tacacs
FTOS uptime is 4 day(s), 4 hour(s), 3 minute(s)
System image file is "dv-m1000e-2-b2" System Type: I/O-
Aggregator
Control Processor: MIPS RMI XLP with 2147483648 bytes of
memory.

256M bytes of boot flash memory.

1 34-port GE/TE (XL)
56 Ten GigabitEthernet/IEEE 802.3 interface(s)
```

Command Fields

Lines Beginning With	Description
Dell Force10 Network...	Name of the operating system
Dell Force10 Operating...	OS version number

Lines Beginning With	Description
Dell Force10 Application...	Software version
Copyright (c)...	Copyright information
Build Time...	Software build's date stamp
Build Path...	Location of the software build files loaded on the system
Dell Force10 uptime is...	Amount of time the system has been up
System image...	Image file name
Chassis Type:	System type (M I/O Aggregator)
Control Processor:...	Control processor information and amount of memory on processor
256M bytes...	Amount of boot flash memory on the system
1 34 Port	Hardware configuration of the system, including the number and type of physical interfaces available

upgrade boot

Upgrade the bootflash image or bootselector image.

Syntax

```
upgrade boot {all | bootflash-image | bootselector-image}
stack-unit {0-5 | all} {booted | flash: |ftp: | tftp: |
usbflash:} (A: | B:}
```

Parameters

all	Enter the keyword `all` to change both the bootflash and bootselecter images.
bootflash-image	Enter the keywords `bootflash-image` to change the bootflash image.
bootselector-image	Enter the keywords `bootselector-image` to change the bootselector image.
0–5	Enter the keyword `0-5` to upgrade only the mentioned stack-unit.
all	Enter the keyword `all` to upgrade all the member stack-units.
booted	Enter the keyword `booted` to upgradefrom the current image in the M I/O Aggregator.
ftp:	After entering the keyword `ftp:`, you can either follow it with the location of the source file in this form: `//`

		`userid:password@hostip/filepath` or press Enter to launch a prompt sequence.
	tftp:	After entering the keyword `tftp:`, you can either follow it with the location of the source file in this form: `//hostlocation/filepath` or press Enter to launch a prompt sequence.
	flash:	After entering the keyword `flash:`, you can either follow it with the location of the source file in this form: `//filepath` or press Enter to launch a prompt sequence.
	usbflash:	After entering the keyword `usbflash:`, you can either follow it with the location of the source file in this form: `//filepath` or press Enter to launch a prompt sequence.
	A:	Enter this keyword to upgrade the bootflash partition A.
	B:	Enter this keyword to upgrade the bootflash partition B.

Defaults none

Command Modes EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information You must reload the Dell Networking OS after executing this command.

Example

```
Dell#upgrade boot ?
all                 Upgrade both boot flash image and selector
image
bootflash-image     Upgrade boot flash image
bootselector-image  Upgrade boot selector image
Dell#
```

upgrade system

Upgrade the bootflash image or system image.

Syntax

```
upgrade system {flash: | ftp: | scp: | tftp: | usbflash: |
stack-unit {0-5 | all} {A: | B:}
```

Parameters

0–5	Enter the keyword `0-5` to upgrade only the mentioned stack-unit.
all	Enter the keyword `all` to upgrade all the member units of the stack.
ftp	After entering the keyword `ftp` you can either follow it with the location of the source file in this form:`//`

	`userid:password@hostip/filepath`, or press Enter to launch a prompt sequence.
scp	After entering the keyword `scp` you can either follow it with the location of the source file in this form:`//userid:password@hostip/filepath`, or press Enter to launch a prompt sequence.
tftp	After entering the keyword `tftp` you can either follow it with the location of the source file in this form:`//hostlocation/filepath`, or press Enter to launch a prompt sequence.
flash	After entering the keyword `flash` you can either follow it with the location of the source file in this form:`//filepath`, or press Enter to launch a prompt sequence.
usbflash	After entering the keyword `usbflash` you can either follow it with the location of the source file in this form:`//filepath`, or press Enter to launch a prompt sequence.
A:	Enter this keyword to upgrade the bootflash partition A.
B:	Enter this keyword to upgrade the bootflash partition B.

Defaults none

Command Modes EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information You must reload Dell Networking OS after executing this command. Use the command `upgrade system stack-unit` to copy Dell Networking OS from the management unit to one or more stack members.

Example

```
Dell#upgrade system ?
flash:         Copy from flash file system (flash://filepath)
ftp:           Copy from remote file system, IPv4 or IPv6,
(ftp:/
/userid:password@hostip/filepath)
scp:           Copy from remote file system, IPv4 or IPv6,
(scp:/
/userid:password@hostip/filepath)
stack-unit Sync image to the stack-unit
tftp:          Copy from remote file system, IPv4 or IPv6,
(tftp:/
/hostip/filepath)
usbflash:      Copy from usbflash file system (usbflash://
filepath)
Dell#
```

5

Control and Monitoring

This chapter describes control and monitoring for the M I/O Aggregator.

asset-tag

Assign and store a unique asset-tag to the stack member.

Syntax	`asset-tag stack-unit` *`unit id Asset-tag ID`* To remove the asset tag, use the `no stack-unit unit-id Asset-tag ID` command.	
Parameters	**stack-unit *unit-id***	Enter the keywords `stack-unit` then the `unit-id` to assign a tag to the specific member. The range is from 0 to 5.
	Asset-tag ID	Enter a unique asset-tag ID to assign to the stack member. This option accepts a maximum of 10 characters, including all special characters except double quotes. To include a space in the asset-tag, enter a space within double quotes.
Defaults	No asset-tag is assigned.	
Command Modes	EXEC Privilege	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator.
Related Commands	show system— Displays the current status of all stack members or a specific member.	

clear alarms

Clear the alarms on the system.

Syntax	`clear alarms`
Command Modes	EXEC Privilege

Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.
Usage Information	This command clears alarms that are no longer active. If an alarm situation is still active, it is seen in the system output.	

clear command history

Clear the command history log.

Syntax	`clear command history`	
Command Modes	EXEC Privilege	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.
Related Commands	show command-history— displays a buffered log of all the commands all users enter along with a time stamp.	

configure

Enter CONFIGURATION mode from EXEC Privilege mode.

Syntax	`configure [terminal]`	
Parameters	**terminal**	(OPTIONAL) Enter the keyword `terminal` to specify that you are configuring from the terminal.
Command Modes	EXEC Privilege	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.
Example	`Dell#configure` `Dell(conf)#`	

debug cpu-traffic-stats

Enable the collection of computer processor unit (CPU) traffic statistics.

Syntax	`debug cpu-traffic-stats`

Defaults	Disabled
Command Modes	EXEC Privilege
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.
Usage Information	This command enables (and disables) the collection of CPU traffic statistics from the time this command is executed (not from system boot). However, excessive traffic a CPU receives automatically triggers (turn on) the collection of CPU traffic statics. To view the traffic statistics, use the `show cpu-traffic-stats` command. If the CPU receives excessive traffic, traffic is rate controlled. **NOTE:** You must enable this command before the `show cpu-traffic-stats` command displays traffic statistics. Dell Networking recommends disabling debugging (`no debug cpu-traffic-stats`) after troubleshooting is complete.
Related Commands	show cpu-traffic-stats— displays the cpu traffic statistics.

debug ifm trace-flags

Turn on the IFM internal trace-flags.

Syntax	`debug ifm trace-flags` *`trace-flags`* To disable this command, use the `no debug ifm trace-flags` command.
Parameters	***trace-flags*** Enter a hexadecimal number representing the trace-flag.
Defaults	None
Command Modes	EXEC Privilege
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.

NOTE: Use this command only when you are working directly with a technical support representative to troubleshoot a problem. Do not use this command unless a technical support representative instructs you to do so.

disable

Return to EXEC mode.

Syntax	`disable [level]`	
Parameters	***level***	(OPTIONAL) Enter a number for a privilege level of the Dell Networking OS. The range is from 0 to 15. The default is **1**.
Defaults	**1**	
Command Modes	EXEC Privilege	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

enable

Enter EXEC Privilege mode or any other privilege level configured. After entering this command, you may need to enter a password.

Syntax	`enable [level]`	
Parameters	***level***	(OPTIONAL) Enter a number for a privilege level of the Dell Networking OS. The range is from 0 to 15. The default is **15**.
Defaults	**15**	
Command Modes	EXEC	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.
Usage Information	Users entering EXEC Privilege mode or any other configured privilege level can access configuration commands. To protect against unauthorized access, use the `enable password` command to configure a password for the `enable` command at a specific privilege level. If no privilege level is specified, the default is privilege level **15**.	
Related Commands	enable password— configures a password for the `enable` command and to access a privilege level.	

end

Return to EXEC Privilege mode from other command modes (for example, CONFIGURATION mode).

Syntax	`end`
Command Modes	• CONFIGURATION • LINE • INTERFACE • MONITOR SESSION • PROTOCOL LLDP
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.
Related Commands	exit— returns to the lower command mode.

exit

Return to the lower command mode.

Syntax	`exit`
Command Modes	• EXEC Privilege • CONFIGURATION • LINE • INTERFACE • PROTOCOL LLDP
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.
Related Commands	end — returns to EXEC Privilege mode.

ftp-server enable

Enable FTP server functions on the system.

Syntax	`ftp-server enable`
Defaults	Disabled

Command Modes	CONFIGURATION
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.

Example

```
morpheus% ftp 10.31.1.111
Connected to 10.31.1.111.
220 FTOS (1.0) FTP server ready
Name (10.31.1.111:dch): dch
331 Password required
Password:
230 User logged in
ftp> pwd
257 Current directory is "flash:"
ftp> dir
200 Port set okay
150 Opening ASCII mode data connection
size  date       time name
-------- ------ ------ --------
 512  Jul-20-2004  18:15:00 tgtimg
 512  Jul-20-2004  18:15:00 diagnostic
 512  Jul-20-2004  18:15:00 other
 512  Jul-20-2004  18:15:00 tgt
226 Transfer complete
329 bytes received in 0.018 seconds (17.95 Kbytes/s)
ftp>
```

Related Commands

ftp-server topdir— sets the directory to be used for incoming FTP connections.

ftp-server username— sets a username and password for incoming FTP connections.

ftp-server topdir

Specify the top-level directory to be accessed when an incoming FTP connection request is made.

Syntax `ftp-server topdir` *directory*

Parameters

directory	Enter the directory path.

Defaults	The internal flash is the default directory.
Command Modes	CONFIGURATION
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.
Usage Information	After you enable FTP server functions with the `ftp-server enable` command, Dell Networking recommends specifying a top-level directory path. Without a top-level directory path specified, the Dell Networking OS directs users to the flash directory when logging in to the FTP server.

Related Commands	ftp-server enable — enables FTP server functions on the M I/O Aggregator. ftp-server username— sets a username and password for incoming FTP connections to the M I/O Aggregator.

ftp-server username

Create a user name and associated password for incoming FTP server sessions.

Syntax

```
ftp-server username username password [encryption-type] password
```

Parameters

username	Enter a text string up to 40 characters long as the user name.
password ***password***	Enter the keyword `password` then a string up to 40 characters long as the password. Without specifying an encryption type, the password is unencrypted.
encryption-type	(OPTIONAL) After the keyword `password`, enter one of the following numbers: • `0` (zero) for an unecrypted (clear text) password • `7` (seven) for a hidden text password

Defaults	Not enabled.
Command Modes	CONFIGURATION
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.

hostname

Set the host name of the system.

Syntax

```
hostname name
```

Parameters

name	Enter a text string, up to 32 characters long.

Defaults	**Dell Networking Operating System (OS)**
Command Modes	CONFIGURATION

Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.
Usage Information	The hostname is used in the prompt.	

ip telnet server enable

Enable the Telnet server on the switch.

Syntax	`ip telnet server enable` To disable the Telnet server, use the `no ip telnet server enable` command.
Defaults	Enabled
Command Modes	CONFIGURATION

Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

ip telnet source-interface

Set an interface's IP address as the source address in outgoing packets for Telnet sessions.

Syntax `ip telnet source-interface` *interface*

Parameters

interface	Enter the following keyword and slot/port or number information: • For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information. • For VLAN interface, enter the keyword `vlan` then a number from 1 to 4094.

Defaults	The IP address on the system that is closest to the Telnet address is used in the outgoing packets.
Command Modes	CONFIGURATION

Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

Related Commands	telnet — telnets to another device.

line

Enable and configure console and virtual terminal lines to the system. This command accesses LINE mode, where you can set the access conditions for the designated line.

Syntax

```
line {console 0 | vty number [end-number]}
```

Parameters

console 0	Enter the keyword `console` 0 to configure the console port. The console option is <0-0>.
vty *number*	Enter the keyword `vty` followed by a number from 0 to 9 to configure a virtual terminal line for Telnet sessions. The system supports 10 Telnet sessions.
end-number	(OPTIONAL) Enter a number from 1 to 9 as the last virtual terminal line to configure. You can configure multiple lines at one time.

Defaults	Not configured
Command Modes	CONFIGURATION
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.
Usage Information	You cannot delete a terminal connection.
Related Commands	show memory— View current memory usage on the M I/O Aggregator.

ping

Test connectivity between the system and another device by sending echo requests and waiting for replies.

Syntax

```
ping [host | ip-address] [count {number | continuous}]
[datagram-size] [timeout] [source (ip src-ipv4-address) |
interface] [tos] [df-bit (y|n)] [validate-reply(y|n)] [pattern
pattern] [sweep-min-size] [sweep-max-size] [sweep-interval]
[ointerface (ip src-ipv4-address) | interface]
```

Parameters

host	(OPTIONAL) Enter the host name of the devices to which you are testing connectivity.
ip-address	(OPTIONAL) Enter the IPv4 address of the device to which you are testing connectivity. The address must be in the dotted decimal format.
count	Enter the number of echo packets to be sent. The default is **5**. • number: from 1 to 2147483647 • continuous: transmit echo request continuously
datagram size	Enter the ICMP datagram size. The range is from 36 to 15360 bytes. The default is **100**.
timeout	Enter the interval to wait for an echo reply before timing out. The range is from 0 to 3600 seconds. The default is **2 seconds**.
source	Enter the IPv4 source ip address or the source interface. Enter the IP address in A.B.C.D format. • For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` then the slot/port information. • For a VLAN interface, enter the keyword `vlan` then a number from 1 to 4094.
tos	Enter the type of service required. The range is from 0 to 255. The default is **0**.
df-bit	Enter `Y` or `N` for the “don't fragment” bit in IPv4 header. • `N`: Do not set the “don't fragment” bit. • `Y`: Do set “don't fragment” bit The default is **No**.
validate-reply	Enter `Y` or `N` for reply validation. • `N`: Do not validate reply data. • `Y`: Do validate reply data. The default is `No`.
pattern *pattern*	Enter the IPv4 data pattern. The range is from 0 to FFFF. The default is **0xABCD**.
sweep-min-size	Enter the minimum size of datagram in sweep range. The range is from 52 to 15359 bytes.
sweep-max-size	Enter the maximum size of datagram in sweep range. The range is from 53 to 15359 bytes.
sweep-interval	Enter the incremental value for sweep size. The range is from 1 to 15308 seconds.

	ointerface	Enter the outgoing interface for multicast packets. Enter the IP address in A.B.C.D format. • For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` then the slot/port information. • For a VLAN interface, enter the keyword `vlan` then a number from 1 to 4094.

Defaults See parameters above.

Command Modes
- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information When you enter the `ping` command without specifying an IP address (Extended Ping), you are prompted for a target IP address, a repeat count, a datagram size (up to 1500 bytes), a timeout (in seconds), and for Extended Commands. For information on the ICMP message codes that return from a `ping` command, refer to Internet Control Message Protocol (ICMP) Message Types.

Example (IPv4)

```
Dell#ping 172.31.1.255

Type Ctrl-C to abort.

Sending 5, 100-byte ICMP Echos to 172.31.1.255, timeout is 2
seconds:
Reply to request 1 from 172.31.1.208 0 ms
Reply to request 1 from 172.31.1.216 0 ms
Reply to request 1 from 172.31.1.205 16 ms
::
Reply to request 5 from 172.31.1.209 0 ms
Reply to request 5 from 172.31.1.66 0 ms
Reply to request 5 from 172.31.1.87 0 ms
Dell#
```

reload

Reboot the Dell Networking OS.

Syntax `reload`

Command Modes EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information	If there is a change in the configuration, the Dell Networking OS prompts you to save the new configuration. Or you can save your running configuration with the `copy running-config` command.
Related Commands	reset stack-unit — resets any designated stack member except the management unit.

service timestamps

Add time stamps to debug and log messages. This command adds either the uptime or the current time and date.

Syntax

```
service timestamps [debug | log] [datetime [localtime] [msec] [show-timezone] | uptime]
```

Parameters

debug	(OPTIONAL) Enter the keyword `debug` to add timestamps to debug messages.
log	(OPTIONAL) Enter the keyword `log` to add timestamps to log messages with severity from 0 to 6.
datetime	(OPTIONAL) Enter the keyword `datetime` to have the current time and date added to the message.
localtime	(OPTIONAL) Enter the keyword `localtime` to include the localtime in the timestamp.
msec	(OPTIONAL) Enter the keyword `msec` to include milliseconds in the timestamp.
show-timezone	(OPTIONAL) Enter the keyword `show-timezone` to include the time zone information in the timestamp.
uptime	(OPTIONAL) Enter the keyword `uptime` to have the timestamp based on time elapsed since system reboot.

Defaults Not configured.

Command Modes CONFIGURATION

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

If you do not specify parameters and enter `service timestamps`, it appears as `service timestamps debug uptime` in the running-configuration.

To view the current options set for the `service timestamps` command, use the `show running-config` command.

show alarms

Display the active major and minor alarms on the system.

Syntax

```
show alarms
```

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Example

```
Dell# show alarms

-- Minor Alarms --
Alarm Type                  Duration
----------------------------------------
No minor alarms

-- Major Alarms --
Alarm Type                  Duration
----------------------------------------
No major alarms

Dell#
```

show command-history

Display a buffered log of all commands all users enter along with a time stamp.

Syntax

```
show command-history
```

Defaults

None

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

One trace log message is generated for each command. No password information is saved to this file.

Example

```
Dell#show command-history
[4/20 10:27:23]: CMD-(CLI):[enable]by default from console
[4/20 10:27:23]: CMD-(CLI):[configure terminal]by default from
console
     - Repeated 1 time.
[4/20 10:27:23]: CMD-(CLI):[snmp-server community public ro]by
default from
console
[4/20 10:27:23]: CMD-(CLI):[logging 172.16.1.162]by default
from console
```

```
[4/20 10:27:23]: CMD-(CLI):[logging 10.10.10.4]by default from
console
[4/20 10:27:24]: CMD-(CLI):[logging 10.1.2.4]by default from
console
[4/20 10:27:24]: CMD-(CLI):[logging 172.31.1.4]by default from
console
[4/20 10:27:24]: CMD-(CLI):[logging 133.33.33.4]by default
from console
[4/20 10:27:24]: CMD-(CLI):[management route 172.16.1.0 /24
10.11.209.4]by default
from console
[4/20 10:27:24]: CMD-(CLI):[service timestamps log datetime]by
default from
console
[4/20 10:27:24]: CMD-(CLI):[line console 0]by default from
console
[4/20 10:27:24]: CMD-(CLI):[exec-timeout 0]by default from
console
[4/20 10:27:24]: CMD-(CLI):[exit]by default from console
[4/20 10:27:29]: CMD-(CLI):[show version]by default from
console
[4/20 10:27:56]: CMD-(CLI):[show interfaces tengigabitethernet
0/3]by default from
console
[4/20 10:55:8]: CMD-(CLI):[show lldp neighbors]by default from
console
[4/20 15:17:6]: CMD-(CLI):[show cam-acl]by default from console
[4/20 16:34:59]: CMD-(CLI):[show running-config interface
tengigabitethernet 0/
55]by default from console
[4/20 16:38:14]: CMD-(CLI):[show vlan]by default from console
[5/4 9:11:52]: CMD-(TEL0):[show version]by admin from vty0
(10.11.68.14)
[5/4 9:12:9]: CMD-(TEL0):[show hosts]by admin from vty0
(10.11.68.14)
[5/4 9:14:38]: CMD-(TEL0):[show arp]by admin from vty0
(10.11.68.14)
[5/4 9:19:29]: CMD-(TEL0):[enable]by admin from vty0
(10.11.68.14)
[5/4 9:19:35]: CMD-(TEL0):[configure]by admin from vty0
(10.11.68.14)
     - Repeated 1 time.
[5/4 9:19:50]: CMD-(TEL0):[interface tengigabitethernet
0/16]by admin from vty0
(10.11.68.14)
[5/4 9:20:11]: CMD-(TEL0):[exit]by admin from vty0
(10.11.68.14)
Dell#
```

Related Commands clear command history — clears the command history log.

show configuration lock

Display the configuration lock status.

Syntax `show configuration lock`

Defaults	None
Command Modes	EXEC Privilege
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.
Usage Information	The type may be auto, manual, or rollback. When set to auto, Dell Networking OS automatically denies access to CONFIGURATION mode to all other users every time the user on the listed VTY line enters CONFIGURATION mode. When set to manual, the user on the listed VTY line must explicitly set the lock each time before entering CONFIGURATION mode. Rollback indicates that Dell Networking OS is in a rollback process. The line number shown in the output can be used to send the messages to that session or release a lock on a VTY line.

Example	`Dell#show configuration lock`
	`Configure exclusively locked by the following line:`
	`Line : vty 0`
	`Line number : 2`
	`User : admin`
	`Type : AUTO`
	`State : LOCKED`
	`Ip address : 10.11.9.97`
	`Dell#`

show cpu-traffic-stats

Display the CPU traffic statistics.

Syntax `show cpu-traffic-stats [port number | all]`

Parameters

port number	(OPTIONAL) Enter the port number to display traffic statistics on that port only. The range is from 1 to 1568.
all	(OPTIONAL) Enter the keyword `all` to display traffic statistics on all the interfaces receiving traffic, sorted based on the traffic.

Defaults	**all**
Command Modes	EXEC
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.
Usage Information	Traffic statistics are sorted on a per-interface basis; the interface receiving the most traffic is displayed first. All CPU and port information is displayed unless a specific port or CPU is specified. Traffic information is displayed for router ports only; not for management interfaces. The traffic statistics are collected only after the `debug cpu-traffic-stats` command is executed; not from the system bootup.

NOTE: After debugging is complete, use the `no debug cpu-traffic-stats` command to shut off traffic statistics collection.

Example

```
Dell#show cpu-traffic-stats
Processor : CP
--------------
  Received 100% traffic on TenGigabitEthernet 8/2 Total
packets:100
    LLC:0, SNAP:0, IP:100, ARP:0, other:0
    Unicast:100, Multicast:0, Broadcast:0
Dell#
```

Related Commands

debug cpu-traffic-stats — enables CPU traffic statistics for debugging.

show debugging

View a list of all enabled debugging processes.

Syntax

```
show debugging
```

Command Modes

EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Example

```
Dell#show debug
Generic IP: (Access List: test)
  IP packet debugging is on for (Access List: test)
    TenGigabitEthernet 0/16
  ICMP packet debugging is on for
    TenGigabitEthernet 0/16
OSPF:1
    OSPF packet debugging is on
DHCP:
    DHCP debugging is on
Dell#
```

show diag

Display the diagnostics information.

Syntax

```
show diag {information | stack-unit number [detail | summary]]
| testcase}
```

Parameters

information	Enter the keyword `information` to view current diagnostics information in the system.

	stack-unit *unit-id*	(OPTIONAL) Enter the keywords `stack-unit` then the *unit-id* to display information on a specific stack member. The range is from 0 to 5.
	detail	(OPTIONAL) Enter the keyword `detail` to view detailed diagnostics information.
	summary	(OPTIONAL) Enter the keyword `summary` to view a summary of the diagnostics information.
	testcase	Enter the keyword `testcase` to view current diagnostics testcases available in the system.
Defaults	Summary	
Command Modes	EXEC Privilege	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

show environment

Displays the system component status (for example, temperature or voltage).

Syntax

```
show environment [all | stack-unit unit-id]
```

Parameters

all	Enter the keyword `all` to view all components.
stack-unit *unit-id*	Enter the keywords `stack-unit` then the unit-id to display information on a specific stack member. The range is from 0 to 5.
thermal sensor	Enter the keywords `thermal-sensor` to view all components.

Command Modes

- EXEC
- EXEC Privilege

Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

Example (all)

```
Dell#show environment all

-- Unit Environment Status --
Unit  Status  Temp  Voltage TempStatus
------------------------------------------------------------------
------------
* 1   online   66C    ok       2
* Management Unit
-- Thermal Sensor Readings (deg C) --
Unit Sensor0 Sensor1 Sensor2 Sensor3 Sensor4 Sensor5 Sensor6
```

```
Sensor7
Sensor8 Sensor9
-------------------------------------------------------------------
-----------------
----------------
1       51      51       63     61      61       61      67
61
64     66
Dell#
```

Example (stack-unit)

```
Dell#show environment stack-unit

-- Unit Environment Status  --
Unit  Status        Temp   Voltage      TempStatus
-------------------------------------------------------------------
------------
* 1  online       66C   ok            2
* Management Unit
Dell#
```

Example (thermal-sensor)

```
Dell#show environment thermal-sensor

-- Thermal Sensor Readings (deg C) --
Unit Sensor0 Sensor1 Sensor2 Sensor3 Sensor4 Sensor5 Sensor6
Sensor7
Sensor8 Sensor9
-------------------------------------------------------------------
-----------------
----------------
1       51      51       64      61       61      61
67     61
64     66
Dell#
```

show inventory

Displays the switch type, components (including media), and Dell Networking OS version including hardware identification numbers and configured protocols.

Syntax `show inventory [media slot]|[optional-module]}`

Parameters

media *slot*	(OPTIONAL) Enter the keyword `media` then the stack ID of the stack member you want to display pluggable media inventory.
optional-module	OPTIONAL) Enter the keyword `optional-module` to display optional module information.

Defaults none

Command Modes EXEC

Command History

Version 8.3.17.0 Supported on the M I/O Aggregator.

Usage Information

If there are no fiber ports in the unit, just the header under `show inventory media` displays. If there are fiber ports but no optics inserted, the output displays "Media not present or accessible".

Example

```
Dell#show inventory
System Type            : PE-FN-410S-IOA
System Mode            : 1.0
Software Version       : 1-0(0-1859)

Unit Type                      Serial Number  Part Number
Rev  Piece Part ID            Rev  Svc Tag  Exprs Svc Code
--------------------------------------------------------------
--------------------------------------------------
* 0  PowerEdge-FN-410S-IOA     TW000000000020 07NVPVX01
X01  TW-07NVPV-00000-000-0020 X01  N/A      N/A

 * - Management Unit


Software Protocol Configured
-----------------------------------------------------------------
  DCBX
  FIP Snooping
  IGMP
  iSCSI
  LLDP
  SNMP
Dell#
```

Example (media)

```
Dell#show inventory media ?
<0-5>                  Slot
number
|                      Pipe through a
command

Dell#show inventory media
Slot   Port     Type        Media               Serial
Number        F10Qualified
-----------------------------------------------------------------
---------------
   0      9     SFP+        10GBASE-CU1M
APF11380028XGQ           Yes
   0     10     SFP+        10GBASE-CU2M
APF12090032HDL           Yes
   0     11     SFP+        10GBASE-CU2M
APF12090032HFB           Yes
   0     12     SFP+        10GBASE-CU0.5M
APF12490013FP2           Yes
Dell#
```

Example (optional-module)

```
Dell#show inventory optional-module
Unit  Slot   Expected    Inserted    Next Boot    Status/
Power(On/Off)
-----------------------------------------------------------------
---------
1     0       SFP+       SFP+          AUTO     Good/On
1     1      QSFP+      QSFP+          AUTO     Good/On
```

```
* - Mismatch
Dell#
```

Related Commands show config (from INTERFACE VLAN mode) — displays information on a specific physical interface or virtual interface.

show memory

Display current memory usage on the M I/O Aggregator.

Syntax `show memory [stack-unit 0–5]`

Parameters

stack-unit *0–5*	(OPTIONAL) Enter the keywords `stack-unit` then the stack unit ID of the stack member to display memory information on the designated stack member.

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information The output for `show memory` command displays the memory usage of LP part (sysdlp) of the system. The sysdlp is an aggregate task that handles all the tasks running on the CPU.

Example

```
Dell#show memory
     Statistics On Unit 0 Processor
     ============================
   Total(b)    Used(b)   Free(b)    Lowest(b)    Largest(b)
268435456   4010354   264425102   264375410    264425102
```

show processes cpu

Display CPU usage information based on processes running.

Syntax `show processes cpu [management-unit 1–99 [details] | stack-unit 0–5 | summary | ipc | memory [stack-unit 0–5]]`

Parameters

management-unit *1-99* [details]	(OPTIONAL) Display processes running in the control processor. The `1-99` variable sets the number of tasks to display in order of the highest CPU usage in the past five (5) seconds. Add the keyword `details` to display all running processes (except sysdlp). Refer to Example (management-unit).

stack-unit *0–5*	(OPTIONAL) Enter the keywords `stack-unit` then the stack member ID. The range is from 0 to 5. As an option of the `show processes cpu` command, this option displays CPU usage for the designated stack member. Or, as an option of `memory`, this option limits the output of memory statistics to the designated stack member. Refer to Example (stack-unit).
summary	(OPTIONAL) Enter the keyword `summary` to view a summary view CPU utilization of processes related to line card processing. Refer to Example (summary).
ipc	(OPTIONAL) Enter the keyword `ipc` to display interprocess communication statistics.
memory	(OPTIONAL) Enter the keyword `memory` to display memory statistics. Refer to Example (memory).

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Example (summary)

```
Dell#show processes cpu summary

CPU utilization       5Sec    1Min    5Min
-----------------------------------------
UNIT1                   4%      3%      2%
```

Example (management-unit)

```
Dell#show processes cpu management-unit 5
CPU utilization for five seconds: 4%/0%; one minute: 4%; five
minutes: 4%
PID         Runtime(ms) Invoked  uSecs  5Sec  1Min  5Min  TTY
Process
0x00000000  2120        212      10000  3.77% 3.77% 3.77% 0
system
0x00000112  2472940     247294   10000  0.79% 0.61% 0.65% 0
sysdlp
0x000000e4  495560      49556    10000  0.20% 0.25% 0.24% 0
sysd
0x0000013d  34310       3431     10000  0.00% 0.02% 0.00% 0
lacp
0x00000121  4190        419      10000  0.00% 0.02% 0.00% 0
iscsiOpt


PID Runtime(ms) Invoked uSecs 5Sec 1Min 5Min TTY Process
Dell#
```

Example (stack-unit)

```
Dell#show process cpu stack-unit 1
CPU utilization for five seconds: 4%/0%; one minute: 3%; five
minutes: 2%
PID       Runtime(ms) Invoked   uSecs  5Sec  1Min  5Min TTY
Process
```

```
0x763a3000 17981680    1798168   10000  3.00% 2.67% 2.67% 0
KP
0x762ba000 0            0          0    0.00% 0.00% 0.00% 0
debugagt
0x762d9000 0            0          0    0.00% 0.00% 0.00% 0
F10StkMgr
0x762f8000 214590      21459     10000  0.00% 0.00% 0.00% 0
lcMgr
0x76319000 7890         789       10000 0.00% 0.00% 0.00% 0 dla
0x76344000 155770      15577      10000 0.00% 0.00% 0.02% 0
sysAdmTsk
0x76363000 583230      58323      10000 0.00% 0.00% 0.02% 0
timerMgr
0x76381000 658850       65885     10000 0.00% 0.17% 0.08% 0 PM
0x76299000 80110       8011       10000 0.00% 0.00% 0.00% 0
diagagt
0x763c3000 0            0          0   0.00%  0.00% 0.00% 0
evagt
--More--
```

Example (memory)

```
Dell#show processes memory

Memory Statistics Of Stack Unit 1 (bytes)
============================================================
Total: 2147483648, MaxUsed:  499019776, CurrentUsed:
499019776, CurrentFree:
1648463872
TaskName     TotalAllocated      TotalFreed      MaxHeld
CurrentHolding
f10appioserv         225280             0
0          192512
fcoecntrl         270336              0             0
9277440
f10appioserv         225280             0
0          192512
iscsiOpt         114688              0             0
7380992
dhclient         552960              0             0
1626112
f10appioserv         225280             0
0          192512
ndpm         618496              0             0
7389184
f10appioserv         225280             0
0          192512
vrrp         335872              0             0
7712768
f10appioserv         225280             0
0          192512
frrp         180224              0             0
7192576
f10appioserv         225280             0
0          192512
xstp        2740224              0             0
9445376
f10appioserv         225280             0
0          192512
pim         1007616              0             0
7585792
f10appioserv         225280             0
0          192512
igmp         417792              0             0
14774272
```

```
f10appioserv         225280              0
0          192512
mrtm          5496832              0             0
12636160
f10appioserv         225280              0
0          192512
l2mgr         1040384               0             0
42471424
f10appioserv         225280              0
0          192512
l2pm           176128              0             0
24166400
f10appioserv         225280              0
0          192512
arpm           192512              0             0
6955008
f10appioserv         225280              0
0          192512
otm           184320              0             0          7127040


--More--
Dell#
```

Example (stack-unit)

```
Dell#show process memory stack-unit 1
Total: 2147483648, MaxUsed:  499040256, CurrentUsed:
499040256, CurrentFree:
1648443392
TaskName     TotalAllocated      TotalFreed      MaxHeld
CurrentHolding
f10appioserv         225280              0
0          192512
fcoecntrl          270336              0             0
9277440
f10appioserv         225280              0
0          192512
iscsiOpt          114688              0             0
7380992
dhclient          552960              0             0
1626112
f10appioserv         225280              0
0          192512
ndpm           618496              0             0
7389184
f10appioserv         225280              0
0          192512
vrrp           335872              0             0
7712768
f10appioserv         225280              0
0          192512
frrp           180224              0             0
7192576
f10appioserv         225280              0
0          192512
xstp          2740224              0             0
9445376
f10appioserv         225280              0
0          192512
pim           1007616              0             0
7585792
f10appioserv         225280              0
0          192512
igmp           417792              0             0
```

```
14774272
f10appioserv          225280              0
0          192512
mrtm         5496832              0             0
12636160

--More--
Dell#
```

Related Commands

show diag— displays the data plane or management plane input and output statistics of the designated component of the designated stack member.

show hardware system-flow— displays Layer 3 ACL or QoS data for the selected stack member and stack member port-pipe.

show interfaces stack-unit— displays information on all interfaces on a specific stack member.

show processes memory— displays CPU usage information based on running processes.

show processes ipc flow-control

Display the single window protocol queue (SWPQ) statistics.

Syntax

```
show processes ipc flow-control [cp]
```

Parameters

cp	(OPTIONAL) Enter the keyword `cp` to view the control processor's SWPQ statistics.

Defaults

none

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

Field	Description
Source QID /Tx Process	Source Service Identifier
Destination QID/Rx Process	Destination Service Identifier
Cur Len	Current number of messages enqueued
High Mark	Highest number of packets in the queue at any time

Field	Description
#of to / Timeout	Timeout count
#of Retr /Retries	Number of retransmissions
#msg Sent/Msg Sent/	Number of messages sent
#msg Ackd/Ack Rcvd	Number of messages acknowledged
Retr /Available Retra	Number of retries left
Total/ Max Retra	Number of retries allowed

Important Points:

- The SWP provides flow control-based reliable communication between the sending and receiving software tasks.
- A sending task enqueues messages into the SWP queue3 for a receiving task and waits for an acknowledgement.
- If no response is received within a defined period of time, the SWP timeout mechanism resubmits the message at the head of the FIFO queue.
- After retrying a defined number of times, the `SWP-2-NOMORETIMEOUT` timeout message is generated.
- In the example, a retry (Retries) value of zero indicates that the SWP mechanism reached the maximum number of retransmissions without an acknowledgement.

Example

```
Dell#show processes ipc flow-control

Q Statistics on CP Processor
TxProcess    RxProcess      Cur      High  Time  Retr
Msg      Ack Aval  Max
Len      Mark  Out   ies      Sent     Rcvd Retra Retra
ACL0         RTM0        0         0     0     0
0        0   10   10
ACL0    DIFFSERV0        0         0     0     0
0        0   10   10
ACL0        IGMP0        0         0     0     0
0        0   10   10
ACL0         PIM0        0         0     0     0
0        0   10   10
LACP0       IFMGR0         0        24     0     0
34       34   25   25
STP0        L2PM0        0         0     0     0
0        0   25   25
L2PM0         STP0         0         1     0     0
2        2   25   25
FRRP0        L2PM0         0         0     0     0
0        0   25   25
DHCP0         ACL0         0         0     0     0
0        0   25   25
DHCP0       IPMGR0         0         0     0     0
0        0   25   25
DHCP0       IFMGR0         0         0     0     0
0        0   25   25
SMUX0       IFMGR0         0        38     0     0
47       47   60   60
```

```
SMUX0         LACP0         0          1      0      0
3         3    60    60
--More--

Dell#
```

show processes memory

Display memory usage information based on processes running in the system.

Syntax

```
show processes memory {management-unit | stack unit {0–5 | all | summary}}
```

Parameters

management-unit	Enter the keywords `management-unit` for CPU memory usage of the stack management unit.
stack unit *0–5*	Enter the keywords `stack unit` then a stack unit ID of the member unit for which to display memory usage on the forwarding processor.
all	Enter the keyword `all` for detailed memory usage on all stack members.
summary	Enter the keyword `summary` for a brief summary of memory availability and usage on all stack members.

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

`show processes memory output`

Field	Description
Total:	Total system memory available
MaxUsed:	Total maximum memory used ever (history indicated with time stamp)
CurrentUsed:	Total memory currently in use
CurrentFree:	Total system memory available
SharedUsed:	Total used shared memory
SharedFree:	Total free shared memory
PID	Process ID
Process	Process Name

Field	Description
ResSize	Actual resident size of the process in memory
Size	Process test, stack, and data size
Allocs	Total dynamic memory allocated
Frees	Total dynamic memory freed
Max	Maximum dynamic memory allocated
Current	Current dynamic memory in use

The output for the `show process memory` command displays the memory usage statistics running on CP part (sysd) of the system. The sysd is an aggregate task that handles all the tasks running on the M I/O Aggregator's CP.

The output of the `show memory` command and this command differ based on which the Dell Networking OS processes are counted.

- In the `show memory` output, the memory size is equal to the size of the application processes.
- In the output of this command, the memory size is equal to the size of the application processes plus the size of the system processes.

Example

```
Dell#show processes memory stack-unit 1
Total: 2147483648, MaxUsed:  499040256, CurrentUsed:
499040256, CurrentFree:
1648443392
TaskName      TotalAllocated       TotalFreed       MaxHeld
CurrentHolding
f10appioserv         225280              0
0          192512
fcoecntrl          270336              0             0
9277440
f10appioserv         225280              0
0          192512
iscsiOpt          114688              0             0
7380992
dhclient          552960              0             0
1626112
f10appioserv         225280              0
0          192512
ndpm           618496              0             0
7389184
f10appioserv         225280              0
0          192512
vrrp           335872              0             0
7712768
f10appioserv         225280              0
0          192512
frrp           180224              0             0
7192576
f10appioserv         225280              0
0          192512
xstp          2740224              0             0
9445376
f10appioserv         225280              0
0          192512
pim           1007616              0             0
7585792
f10appioserv         225280              0
```

```
0          192512
igmp         417792              0             0
14774272
f10appioserv         225280              0
0          192512
mrtm        5496832              0             0
12636160


--More--
```

Example (management-unit)

```
Dell#show processes memory management-unit
Total     : 2147483648, MaxUsed    :   499093504 [07/23/2012
17:42:16]
CurrentUsed:   499093504, CurrentFree:  1648390144
SharedUsed :    18470440, SharedFree :     2501104

PID  Process          ResSize      Size      Allocs
Frees      Max Current
633 fcoecntrl          9277440     270336    1380528
132512    1281144
1248016
289 iscsiOpt          7380992    114688     23262
16564     23262
6698
476 dhclient          1626112    552960         0
0         0
0
521 ndpm              7389184     618496      4848
0      4848
4848
160 vrrp              7712768     335872       880
0       880
880
318 frrp              7192576     180224     71086
66256     21394
4830
218 xstp              9445376    2740224      21858
0      21858
21858
277 pim               7585792    1007616      62168
0      62168
62168
--More--
```

show revision

Displays the revision numbers of all stack-units.

Syntax

```
show revision
```

Command Modes

- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Example (Command)

```
Dell#show revision
-- Stack unit 1 --
IOM SYSTEM CPLD : 1
Dell#
```

show server-interfaces

Displays server port information.

Syntax

```
show server-interfaces{brief|detail}
```

Command Modes

- EXEC Privilege

Command History

Version 9.4(0.0)	Supported on the FN I/O aggregator.

Example (brief Command)

```
Dell#show server-interfaces brief

 ---------------- show server ports brief ----------------------

Interface                OK  Status     Protocol    Description
TenGigabitEthernet 0/1   YES up         up
TenGigabitEthernet 0/2   YES up         up
TenGigabitEthernet 0/3   YES up         up
TenGigabitEthernet 0/4   NO  up         down
TenGigabitEthernet 0/5   YES up         up
TenGigabitEthernet 0/6   NO  up         down
TenGigabitEthernet 0/7   YES up         up
TenGigabitEthernet 0/8   NO  up         down

 ---------------------------------- show lacp
--------------------------
Interface                OK  Status     Protocol    Description
Port-channel 1           YES up         up
Dell#
```

Example (detail Command)

```
Dell#show server-interfaces detail

 ---------------- show server ports detail
---------------------

TenGigabitEthernet 0/1 is up, line protocol is up
Hardware is DellEth, address is 00:1e:c9:de:03:79
    Current address is 00:1e:c9:de:03:79
Server Port AdminState is N/A
Pluggable media not present
Interface index is 33886978
Internet address is not set
Mode of IPv4 Address Assignment : NONE
DHCP Client-ID :001ec9de0379
MTU 12000 bytes, IP MTU 11982 bytes
LineSpeed 10000 Mbit
Flowcontrol rx off tx off
ARP type: ARPA, ARP Timeout 04:00:00
Last clearing of "show interface" counters 2d16h24m
Queueing strategy: fifo
```

```
Input Statistics:
     10701 packets, 1123557 bytes
     0 64-byte pkts, 10701 over 64-byte pkts, 0 over 127-byte
pkts
     0 over 255-byte pkts, 0 over 511-byte pkts, 0 over 1023-
byte pkts
     10701 Multicasts, 0 Broadcasts
     0 runts, 0 giants, 0 throttles
     0 CRC, 0 overrun, 0 discarded
Output Statistics:
     442113 packets, 46047526 bytes, 0 underruns
     870 64-byte pkts, 362829 over 64-byte pkts, 55411 over
127-byte pkts
--More--
```

show system

Displays the current status of all stack members or a specific stack member.

Syntax

```
show system [brief | stack-unit unit-id]
```

Parameters

brief	(OPTIONAL) Enter the keyword `brief` to view an abbreviated list of system information.
stack unit *unit–id*	(OPTIONAL) Enter the keywords `stack unit` then the stack member ID for information on the stack member. The range is from 0 to 5.

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Example (show system brief command)

```
Dell#show system brief
Stack MAC : 00:01:e8:00:ab:03
-- Stack Info --
Unit UnitType Status ReqTyp CurTyp Version Ports
-------------------------------------------------------------------
-----------------
----
0 Member not present
1 Management online I/O-Aggregator I/O-Aggregator 8-3-17-38 56
2 Member not present
3 Member not present
4 Member not present
5 Member not present
Dell#
```

Example (stack-unit command)

```
Dell#show system stack-unit 1
-- Unit 1 --
Unit Type : Management Unit
Status : online
Next Boot : online
```

```
Required Type : I/O-Aggregator - 34-port GE/TE (XL)
Current Type : I/O-Aggregator - 34-port GE/TE (XL)
Master priority : 0
Hardware Rev : 01
Num Ports : 56
Up Time : 4 day, 7 hr, 9 min
FTOS Version : 8-3-17-38
Jumbo Capable : yes
POE Capable : no
Boot Flash : A: 4.0.1.0bt [booted] B: 4.0.1.0bt1
Boot Selector : 4.0.0.0bt
Memory Size : 2147483648 bytes
Temperature : 67C
Voltage : ok
Switch Power : GOOD
Product Name : I/O Aggregator
Mfg By : DELL
Mfg Date :
Serial Number : 00000000000000
Part Number : NVH81X01
Piece Part ID : 00-NVH81X-00000-000-0000
PPID Revision : 01
Service Tag : N/A
Expr Svc Code : N/A
Chassis Svce Tag: RTWB200
Fabric Id : C2
Asset tag : test
PSOC FW Rev : 0xb
ICT Test Date : 0-0-0
ICT Test Info : 0x0
Max Power Req : 31488
Fabric Type : 0x3
Fabric Maj Ver : 0x1
Fabric Min Ver : 0x0
SW Manageability: 0x4
HW Manageability: 0x1
Max Boot Time : 3 minutes
Link Tuning : unsupported
Auto Reboot : enabled
Burned In MAC : 00:01:e8:00:ab:03
No Of MACs : 3
Dell#
```

Related Commands

asset-tag—Assign and store unique asset-tag to the stack member.

show version— Displays the Dell version.

show processes memory—Displays the memory usage based on the running processes.

show system stack-ports— Displays information about the stack ports on all switches in the stack.

show diag— Displays the data plane and management plane input and output statistics of a particular stack member.

show tech-support

Displays a collection of data from other show commands, necessary for Dell Networking technical support to perform troubleshooting on M I/O Aggregators.

Syntax `show tech-support [stack-unit unit-id | page]`

Parameters

stack-unit	(OPTIONAL) Enter the keyword `stack-unit` to view CPU memory usage for the stack member designated by *unit-id*. The range is 0 to 5.
page	(OPTIONAL) Enter the keyword `page` to view 24 lines of text at a time. Press the SPACE BAR to view the next 24 lines. Press the ENTER key to view the next line of text. When using the pipe command (|), enter one of these keywords to filter command output. Refer to CLI Basics for details on filtering commands.
save	Enter the keyword `save` to save the command output. flash: Save to local flash drive `(flash://filename` (max 20 chars))

Command Modes

- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

Without the `page` or `stack-unit` option, the command output is continuous, use Ctrl-z to interrupt the command output.

The `save` option works with other filtering commands. This allows you to save specific information of a show command. The `save` entry must always be the last option.

For example: `Dell#show tech-support |grep regular-expression | except regular-expression | find regular-expression | save flash://result`

This display output is an accumulation of the same information that is displayed when you execute one of the following `show`commands:

- `show cam`
- `show clock`
- `show environment`
- `show file`
- `show interfaces`
- `show inventory`
- `show processes cpu`

- show processes memory
- show running-conf
- show version

Example (save)

```
Dell#show tech-support ?
page          Page through output
stack-unit    Unit Number
|             Pipe through a command
<cr>
Dell#show tech-support stack-unit 1 ?
page          Page through output
|             Pipe through a command
<cr>
Dell#show tech-support stack-unit 1 | ?
except S     how only text that does not match a pattern
find         Search for the first occurrence of a pattern
grep         Show only text that matches a pattern
no-more      Don't paginate output
save         Save output to a file
Dell#show tech-support stack-unit 1 | save ?
flash:     Save to local file system (flash://filename (max 20
chars) )
usbflash:  Save to local file system (usbflash://filename (max
20
chars) )
Dell#show tech-support stack-unit 1 | save flash://LauraSave
Start saving show command report .......
Dell#
Dell#dir
Directory of flash:
Directory of flash:
1 drwx 4096 Jan 01 1980 01:00:00 +01:00 .
2 drwx 2048 May 16 2012 10:49:01 +01:00 ..
3 drwx 4096 Jan 24 2012 19:38:32 +01:00 TRACE_LOG_DIR
4 drwx 4096 Jan 24 2012 19:38:32 +01:00 CORE_DUMP_DIR
5 d--- 4096 Jan 24 2012 19:38:34 +01:00 ADMIN_DIR
6 -rwx 10303 Mar 15 2012 18:37:20 +01:00 startup-config.bak
7 -rwx 7366 Apr 20 2012 10:57:02 +01:00 startup-config
8 -rwx 4 Feb 19 2012 07:05:02 +01:00 dhcpBindConflict
9 -rwx 12829 Feb 18 2012 02:24:14 +01:00 startup-config.backup
10 drwx 4096 Mar 08 2012 22:58:54 +01:00 WJ_running-config
11 -rwx 7689 Feb 21 2012 04:45:40 +01:00 stbkup
flash: 2143281152 bytes total (2131476480 bytes free)
Dell
```

Example (support)

```
Dell#show tech-support stack-unit 1
---------------------------------- show version
------------------------------
Dell Networking Real Time Operating System Software
Dell Networking Operating System Version: 1.0
Dell Networking Application Software Version: E8-3-17-38
Copyright (c) 1999-2012 by Dell Inc. All Rights Reserved.
Build Time: Thu Jul 19 05:59:59 PDT 2012
Build Path: /sites/sjc/work/swsystems01-2/ravisubramani/
ravis-8317/SW/SRC/Cp_src/
Tacacs
FTOS uptime is 4 day(s), 7 hour(s), 14 minute(s)
System image file is "dv-m1000e-2-b2"
System Type: I/O-Aggregator
Control Processor: MIPS RMI XLP with 2147483648 bytes of
memory.
```

```
256M bytes of boot flash memory.
1 34-port GE/TE (XL)
56 Ten GigabitEthernet/IEEE 802.3 interface(s)
---------------------------------- show clock
------------------------------
17:49:37.2 UTC Mon Jul 23 2012
---------------------------------- show running-config
------------------------
Current Configuration ...
! Version E8-3-17-38
! Last configuration change at Mon Jul 23 17:10:18 2012 by
default
!
boot system stack-unit 1 primary tftp://10.11.9.21/dv-m1000e-2-
b2
boot system stack-unit 1 default system: A:
boot system gateway 10.11.209.62
!
redundancy auto-synchronize full
!
service timestamps log datetime
!
hostname FTOS
---------------------------------- show ip management route
-------------------
Destination Gateway State
----------- ------- -----
1
--More--
Dell#
```

Related Commands

show version — displays the Dell Networking OS version.

show system — displays the current switch status..

show environment — displays system component status.

show processes memory — displays memory usage based on the running processes.

show uplink brief

Displays the uplink port information.

Syntax `show uplink {brief|detail}`

Parameters

brief	Enter the keyword `brief` to display a brief summary of the uplink port information.
detail	Enter the keyword `detail` to display uplink port information with description.

Command Modes

- EXEC Privilege

Command History

Version 9.4(0.0)	Supported on the FN I/O aggregator.

Example (brief)

```
Dell#show uplink brief

 ---------------- show uplink brief ---------------------

Interface                OK  Status     Protocol    Description
TenGigabitEthernet 0/9   NO  up         down
TenGigabitEthernet 0/10  YES up         up
TenGigabitEthernet 0/11  YES up         up
TenGigabitEthernet 0/12  YES up         up

 ---------------------------------- show lacp
--------------------------
Interface                OK  Status     Protocol    Description
Port-channel 128         YES up         up

----------------show uplink state group
1-------------------------------


Uplink State Group: 1   Status: Enabled, Up
Dell#
```

Example (detail)

```
Dell#show uplink detail
 ---------------- show uplink detail ---------------------

TenGigabitEthernet 0/1 is up, line protocol is up
Hardware is DellEth, address is 00:1e:c9:de:03:79
    Current address is 00:1e:c9:de:03:79
Server Port AdminState is N/A
Pluggable media not present
Interface index is 33886978
Internet address is not set
Mode of IPv4 Address Assignment : NONE
DHCP Client-ID :001ec9de0379
MTU 12000 bytes, IP MTU 11982 bytes
LineSpeed 10000 Mbit
Flowcontrol rx off tx off
ARP type: ARPA, ARP Timeout 04:00:00
Last clearing of "show interface" counters 2d16h54m
Queueing strategy: fifo
Input Statistics:
     10761 packets, 1129857 bytes
     0 64-byte pkts, 10761 over 64-byte pkts, 0 over 127-byte
pkts
     0 over 255-byte pkts, 0 over 511-byte pkts, 0 over 1023-
byte pkts
     10761 Multicasts, 0 Broadcasts
     0 runts, 0 giants, 0 throttles
     0 CRC, 0 overrun, 0 discarded
Output Statistics:
     447767 packets, 46578148 bytes, 0 underruns
     1029 64-byte pkts, 367502 over 64-byte pkts, 55962 over
127-byte pkts
     21161 over 255-byte pkts, 630 over 511-byte pkts, 1483
over 1023-byte pkts
     426647 Multicasts, 18490 Broadcasts, 2630 Unicasts
```

```
     0 throttles, 0 discarded, 0 collisions, 0 wreddrops
Rate info (interval 299 seconds):
     Input 00.00 Mbits/sec,          0 packets/sec, 0.00% of
line-rate
     Output 00.00 Mbits/sec,          3 packets/sec, 0.00% of
line-rate
Time since last interface status change: 2d16h51m


TenGigabitEthernet 0/2 is up, line protocol is up
Hardware is DellEth, address is 00:1e:c9:de:03:79
    Current address is 00:1e:c9:de:03:79
Server Port AdminState is N/A
Pluggable media not present
Interface index is 34149122
Internet address is not set
Mode of IPv4 Address Assignment : NONE
--More--
```

show util-threshold cpu

Displays the set CPU utilization threshold values.

Syntax	`show util-threshold cpu`
Command Modes	• EXEC Privilege
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.
Usage Information	This command displays all CPU utilization thresholds of the management, standby, and stack-units.

show util-threshold memory

Displays the set memory utilization threshold values.

Syntax	`show util-threshold memory`
Command Modes	• EXEC Privilege
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.
Usage Information	This command displays all memory utilization thresholds of the management, standby, and stack-units.

ssh-peer-stack-unit

Open an SSH connection to the peer stack-unit.

Syntax `ssh-peer-stack-unit [-| username]`

Parameters

-| username	(OPTIONAL) Enter the keyword –| followed by your username. Default: The username associated with the terminal.

Defaults Not configured.

Command Modes
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

telnet

Connect through Telnet to a server. The Telnet client and server in Dell Networking OS support IPv4 and IPv6 connections. You can establish a Telnet session directly to the router or a connection can be initiated from the router.

Syntax `telnet {host | ip-address [/source-interface]`

Parameters

host	Enter the name of a server.
ip-address	Enter the IPv4 address in dotted decimal format or the IPv6 address in the x:x:x:x::x format of the server. **NOTE:** The :: notation specifies successive hexadecimal fields of zeros. Only one occurrence of this notation is permitted in an IPv6 address.
source-interface	(OPTIONAL) Enter the keywords `/source-interface` then the interface information to include the source interface. Enter the following keywords and slot/port or number information: • For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` then the slot/port information. • For a VLAN interface, enter the keyword `vlan` then a number from 1 to 4094.

Defaults Not configured.

Command Modes	• EXEC • EXEC Privilege	
Command History	**Version 9.4(0.0)**	Supported on the FN I/O aggregator.
Usage Information	Telnet to link-local addresses is not supported.	

telnet-peer-stack-unit

Open a telnet connection to the peer stack-unit.

Syntax	`telnet-peer-stack-unit`	
Defaults	Not configured.	
Command Modes	• EXEC Privilege	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

terminal length

Configure the number of lines displayed on the terminal screen.

Syntax	`terminal length` *`screen-length`* To return to the default values, use the `no terminal length` command.	
Parameters	*screen-length*	Enter a number of lines. Entering zero will cause the terminal to display without pausing. The range is from 0 to 512. Default: 24 lines
Defaults	24 lines	
Command Modes	• EXEC • EXEC Privilege	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

terminal monitor

Configure the Dell Networking OS to display messages on the monitor/terminal.

Syntax	`terminal monitor` To return to default settings, use the `no terminal monitor` command.
Defaults	Disabled
Command Modes	• EXEC • EXEC Privilege

Command History		
	Version 8.3.17.0	Supported on the M I/O Aggregator.

terminal xml

Enable XML mode in Telnet and SSH client sessions.

Syntax	`terminal xml` To exit the XML mode, use the `no terminal monitor` command.
Defaults	Disabled
Command Modes	• EXEC • EXEC Privilege

Command History		
	Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information	This command enables XML input mode where you can either cut and paste XML requests or enter the XML requests line-by-line.

trace route

View the packet path to a specific device.

Syntax	`traceroute {`*`host`* `|` *`ip-address`*`}`

Parameters		
	host	Enter the name of device.
	ip-address	Enter the IP address of the device in dotted decimal format.

Defaults	Timeout = 5 seconds; Probe count = 3; 30 hops max; 40 byte packet size; UDP port = 33434
Command Modes	• EXEC • EXEC Privilege
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.
Usage Information	When you enter the traceroute command without specifying an IP address (Extended Traceroute), you are prompted for a target and source IP address, timeout in seconds (default is 5), a probe count (default is 3), minimum TTL (default is 1), maximum TTL (default is 30), and port number (default is 33434). To keep the default setting for those parameters, press the ENTER key.

Example (IPv4)	`Dell#traceroute www.force10networks.com`
	`Translating "www.force10networks.com"...domain server (10.11.0.1) [OK]`
	`Type Ctrl-C to abort.`
	`----------`
	`Tracing the route to www.force10networks.com (10.11.84.18), 30 hops max, 40 byte packets`
	`----------`
	`TTL Hostname Probe1 Probe2 Probe3`
	`1 10.11.199.190 001.000 ms 001.000 ms 002.000 ms`
	`2 gwegress-sjc-02.force10networks.com (10.11.30.126) 005.000 ms 001.000 ms 001.000 ms`
	`3 fw-sjc-01.force10networks.com (10.11.127.254) 000.000 ms 000.000 ms 000.000 ms`
	`4 www.force10networks.com (10.11.84.18) 000.000 ms 000.000 ms 000.000 ms`
	`Dell#`

Related Commands	ping — Tests the connectivity to a device.

undebug all

Disable all debug operations on the system.

Syntax	`undebug all`
Defaults	none
Command Modes	• EXEC Privilege

Command History	Version 8.3.17.0	Supported on the M I/O Aggregator.

write

Copy the current configuration to either the startup-configuration file or the terminal.

Syntax `write {memory | terminal}`

Parameters

memory	Enter the keyword `memory` to copy the current running configuration to the startup configuration file. This command is similar to the `copy running-config startup-config` command.
terminal	Enter the keyword `terminal` to copy the current running configuration to the terminal. This command is similar to the `show running-config`command.

Command Modes

- EXEC Privilege

Command History	Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information The `write memory` command saves the running-configuration to the file labeled startup-configuration. When using a LOCAL CONFIG FILE other than the startup-config not named “startup-configuration”, the running-config is not saved to that file; use the `copy` command to save any running-configuration changes to that local file.

6

u-Boot

All commands in this chapter are in u-Boot mode. These commands are supported on the Dell Networking Aggregator only.

To access this mode, hit **Esc** key when the following line appears on the console during a system boot:

```
Hit Esc key to interrupt autoboot:
```

You enter u-Boot immediately, as indicated by the `BOOT_USER#` prompt.

NOTE: Only the most frequently used commands available in uBoot mode are described in this chapter.

In uBoot mode, you cannot use the Tab key for command completion.

boot change

Change the operating system boot parameters.

Syntax	`boot change [primary | secondary | default]`	
Command Modes	• uBoot	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

boot selection

Change the ROM bootstrap bootflash partition.

Syntax	`boot selection[a | b]`	
Command Modes	• uBoot	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

boot show net config retries

Show the number of retries for network boot configuration failure.

Syntax	`boot show net config retries`
Command Modes	• uBoot
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.

Example	`BOOT_USER# boot show net config retries`
	`Number of Network Boot Config Retries is : 0`
	`BOOT_USER #`

boot write net config retries

Set the number of retries for network boot configuration failure.

Syntax	`boot write net config retries <int>`
Command Modes	• uBoot
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.

Example	`BOOT_USER # boot write net config retries 2`
	`Updated number of Network Boot Config retries to 2.`
	`BOOT_USER #`

boot zero

Clears the primary, secondary, or default boot parameters.

Syntax	`boot zero [primary| secondary| default]`
Command Modes	• uBoot
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.

default gateway

Set the default gateway IP address.

Syntax	`default-gateway <ip-address>`	
Command Modes	• uBoot	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

enable

Change the access privilege level.

Syntax	`enable [user| admin]`	
Command Modes	• uBoot	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

help

Displays the help menu.

Syntax	`help`	
Command Modes	• uBoot	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

Example

```
BOOT_USER # help
***** Dell Force10 Boot Interface Help Information *****
Current access level: USER LEVEL
Use "syntax help" for more information on syntax.
Available command list (22 commands total):
boot change [primary|secondary|default]
  change operating system boot parameters
boot selection [a|b]
  change the rom bootstrap bootflash partition
boot show net config retries
  show number of retries for network boot config failure
boot write net config retries <int>
  write number of retries for network boot config failure
boot zero [primary|secondary|default]
  zero operating system boot parameters
```

```
default-gateway <ip-address>
  default-gateway - set the default gateway ip address
enable [user|admin]
   change access privilege level
help
    display help menu
-(36%)-Use <CR> to continue, q to stop:
BOOT_USER #
```

ignore enable password

Ignore the enabled password.

Syntax	`ignore enable-password`	
Command Modes	• uBoot	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

ignore startup-config

Ignore the system startup configuration.

Syntax	`ignore startup-config`	
Command Modes	• uBoot	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

interface management ethernet ip address

Set the management port IP address and mask.

Syntax	`interface management ethernet ip address <ip/mask>`	
Command Modes	• uBoot	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

no default gateway

Clear the default gateway IP address.

Syntax	`no default-gateway`	
Command Modes	• uBoot	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

no interface management ethernet ip address

Clear the management port IP address and mask.

Syntax	`no interface management ethernet ip address`	
Command Modes	• uBoot	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

reload

Reload the M I/O Aggregator.

Syntax	`reload`	
Command Modes	• uBoot	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

show boot blc

Show the boot loop counter value.

Syntax	`show boot blc`
Command Modes	• uBoot

Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

Example

```
BOOT_USER # show boot blc ?
Total 1 possible command found.
Possible command list:
show boot blc
     show the boot loop counter value
BOOT_USER # show boot blc
Boot Loop Counter : 10

BOOT_USER #
```

show boot selection

Displays the ROM bootstrap bootflash partition.

Syntax

```
show boot selection
```

Command Modes

- uBoot

Command History	**Version 9.4(0.0)**	Supported on the FN I/O aggregator.

Example

```
BOOT_USER # show boot selection

ROM BOOTSTRAP SELECTOR PARMETERS:
================================
Next ROM bootstrap set to occur from Bootflash partition B.

Last ROM bootstrap occurred from Bootflash partition B.

BOOT_USER #
```

show bootflash

Show the summary of boot flash information.

Syntax

```
show bootflash
```

Command Modes

- uBoot

Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

Example

```
BOOT_USER # show bootflash

GENERAL BOOTFLASH INFO
```

```
=====================
Bootflash Partition A:
   Dell Force10 Networks System Boot
   Official IOM_LP_IMG_BOOT_LOADER, BSP Release 4.0.1.0bt1
   Created Tue May 1 10:56:16 2012 by build on login-sjc-01

Bootflash Partition B:
   Dell Force10 Networks System Boot
   Official IOM_LP_IMG_BOOT_LOADER, BSP Release 4.0.1.0bt1
   Created Tue May 1 10:56:16 2012 by build on login-sjc-01

Boot Selector Partition:
   Dell Force10 Networks System Boot
   Official IOM_XLOAD_LP_IMG_BOOT_SELECTOR, BSP Release
4.0.0.0bt1
   Created Tue May 1 10:56:34 2012 by build on login-sjc-01

BOOT_USER #
```

show bootvar

Show the summary of operating system boot parameters.

Syntax

```
show bootvar
```

Command Modes

- uBoot

Command History

Version 9.4(0.0)	Supported on the FN I/O aggregator.

Example

```
BOOT_USER # show bootvar

PRIMARY OPERATING SYSTEM BOOT PARAMETERS:
========================================
boot device                       : tftp
file name                         : stomp-ben
Management Etherenet IP address   : 10.16.150.160/16
Server IP address                 : 10.16.127.35
No Default Gateway IP address specified!
Management Etherenet MAC address  : 00:1E:C9:DE:03:79

SECONDARY OPERATING SYSTEM BOOT PARAMETERS:
========================================
boot device                       : flash
file name                         : systema (system://A
Partition)

DEFAULT OPERATING SYSTEM BOOT PARAMETERS:
========================================
boot device                       : tftp
file name                         : FTOS-FN-1-0-0-1344.bin
Management Etherenet IP address   : 10.16.150.160/16
Server IP address                 : 10.16.127.35
No Default Gateway IP address specified!
Management Etherenet MAC address  : 00:1E:C9:DE:03:79
```

```
BOOT_USER #
```

show default gateway

Displays the default gateway IP address.

Syntax `show default-gateway`

Command Modes
- uBoot

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Example

```
BOOT_USER # show default-gateway
Gateway IP address: 15.0.0.1
BOOT_USER #
```

show interface management ethernet

Show the management port IP address and mask.

Syntax `show interface management ethernet`

Command Modes
- uBoot

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Example

```
BOOT_USER # show interface management ethernet
Management ethernet IP address: 10.16.130.134/16
BOOT_USER #
```

show interface management port config

Show the management port boot characteristics.

Syntax `show interface management port config`

Command Modes
- uBoot

Command History	Version 8.3.17.0	Supported on the M I/O Aggregator.

Example

```
BOOT_USER # show interface management port config
Management ethernet Port Configuration: no Auto Negotiate
Management ethernet Port Configuration: 100M
Management ethernet Port Configuration: full duplex
BOOT_USER #
```

syntax help

Show the syntax information.

Syntax `help`

Command Modes
- uBoot

Command History	Version 8.3.17.0	Supported on the M I/O Aggregator.

7

Data Center Bridging (DCB)

Data center bridging (DCB) refers to a set of IEEE Ethernet enhancements that provide data centers with a single, robust, converged network to support multiple traffic types, including local area network (LAN), server, and storage traffic. DCB features are auto-configured in standalone mode and supported in stacking mode.

The Dell Networking OS commands for DCB features include 802.1Qbb priority-based flow control (PFC), 802.1Qaz enhanced transmission selection (ETS), and the data center bridging exchange (DCBX) protocol.

CLI commands for individual DCB features are as follows:

DCB commands

- dcb enable auto-detect on-next-reload
- dcb-map
- dcb-policy input stack-unit stack-ports all

PFC Commands

- clear pfc counters
- show interface pfc
- show interface pfc statistics
- show stack-unit stack-ports pfc details

ETS Commands

- clear ets counters
- show interface ets
- show stack-unit stack-ports ets details
- qos-policy-output ets

DCBX Commands

- dcbx version
- show dcb
- show interface dcbx detail

clear ets counters

Clear ETS TLV counters.

Syntax `clear ets counters [tengigabitethernet slot/port]`

Parameters	**slot/port**	Enter the slot/port number.
Command Modes	• EXEC Privilege	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

clear pfc counters

Clear the PFC TLV counters and PFC statistics on an interface or stack unit.

Syntax

```
clear pfc counters [port-type slot/port [statistics]]| [stack-unit {unit-number | all} stack-ports all]
```

Parameters

port-type	Enter the keywords `port-type` then the slot/port information.
stack-unit *unit number*	Enter the keywords `stack-unit` then the stack-unit number to clear. The range is from 0 to 5.
all stack-ports all	Enter the keywords `all stack-ports all` to clear the counters on all interfaces.
statistics	Enter the keyword `statistics` to clear only the hardware PFC counters.

Defaults	None
Command Modes	• EXEC Privilege
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.
Usage information	If you do not use the `statistics` parameter, both hardware and DCBx counters clear.

dcb enable auto-detect on-next-reload

Enables or disables global DCB on a subsequent reload. This command also internally configures PFC buffers based on DCB enable/disable. Save and reload is mandatory for the configurations to take effect. Auto-detect keyword can be used to re-enable IOA with port wise DCB auto detect feature.

Syntax

```
dcb enable {on-next-reload | auto-detect on-next-reload}
```

To disable global DCB on a subsequent reload, use the `no dcb enable on-next-reload` command.

Parameters

auto-detect	Enter the keyword `auto-detect` to re-enable the Aggregator with port wise DCB auto detect feature.

Defaults

DCB is globally enabled with auto-detect feature.

Command Modes

- CONFIGURATION

Command History

Version 8.3.17.3	Added auto-detect parameter.
Version 8.3.17.0	Supported on the M I/O Aggregator.

Example (Disable)

```
Dell#show dcb stack-unit 0 port-set 0
DCB Status : Enabled
Dell#
Dell#conf
Dell(conf)#dcb enable ?
on-next-reload Apply DCB configs on subsequent reload
Dell(conf)#no dcb enable on-next-reload
Dell(conf)#00:03:11: %STKUNIT0-M:CP %DIFFSERV-6-
DCB_DISABLE_CFG_ON_RELOAD:
Global DCB will be disabled on subsequent reload, All reserved
PFC buffers will
be deleted from each stack unit. For the pfc-buffering change
to take effect,
please save the config and reload the system.
Dell(conf)#end
Dell#00:03:23: %STKUNIT0-M:CP %SYS-5-CONFIG_I: Configured from
console
Dell#write memory
00:03:28: %STKUNIT0-M:CP %FILEMGR-5-FILESAVED: Copied running-
config to
startup-config in flash by default
Dell#reload
Proceed with reload [confirm yes/no]: yes
00:04:13: %STKUNIT0-M:CP %CHMGR-5-RELOAD: User request to
reload the chassis
syncing disks... done
unmounting file systems...
unmounting /f10/flash (/dev/ld0e)...
unmounting /usr (mfs:31)...
unmounting /lib (mfs:23)...
unmounting /f10 (mfs:20)...
unmounting /tmp (mfs:15)...
unmounting /kern (kernfs)...
unmounting / (/dev/md0a)... done
rebooting...
Dell#
Dell#show dcb stack-unit 0 port-set 0
stack-unit 0 port-set 0
DCB Status : Disabled
PFC Port Count : 0 (current), 0 (configured)
PFC Queue Count : 0 (current), 0 (configured)
Dell#
```

Example (Enable)

```
Dell#show dcb stack-unit 0 port-set 0
DCB Status : Disabled
Dell#
Dell#
Dell#conf
Dell(conf)#dcb enable on-next-reload
Dell(conf)#00:02:35: %STKUNIT0-M:CP %DIFFSERV-6-
DCB_ENABLE_CFG_ON_RELOAD:
Global DCB will be enabled on subsequent reload, PFC buffers
will be reserved
for all pfc ports and max loss less queues supported for each
stack unit. For
the pfc-buffering change to take effect, please save the
config and reload the
system.
Dell(conf)#end
Dell#00:02:38: %STKUNIT0-M:CP %SYS-5-CONFIG_I: Configured from
console
Dell#write memory
00:02:41: %STKUNIT0-M:CP %FILEMGR-5-FILESAVED: Copied running-
config to
startup-config in flash by default
Dell#reload
Proceed with reload [confirm yes/no]: yes
syncing disks... done
unmounting file systems...
unmounting /f10/flash (/dev/ld0e)...
unmounting /usr (mfs:31)...
unmounting /lib (mfs:23)...
unmounting /f10 (mfs:20)...
unmounting /tmp (mfs:15)...
unmounting /kern (kernfs)...
unmounting / (/dev/md0a)... done
rebooting...
Dell#show dcb stack-unit 0 port-set 0
stack-unit 0 port-set 0
DCB Status : Enabled
PFC Port Count : 56 (current), 56 (configured)
PFC Queue Count : 2 (current), 2 (configured)
Dell#
```

Example (Enable DCB with Auto-Detect)

```
Dell#show dcb stack-unit 0 port-set 0
DCB Status : Disabled
Dell#
Dell#
Dell#conf
Dell(conf)#dcb enable on-next-reload
Dell(conf)#00:02:35: %STKUNIT0-M:CP %DIFFSERV-6-
DCB_ENABLE_CFG_ON_RELOAD:
Global DCB will be enabled on subsequent reload, PFC buffers
will be reserved
for all pfc ports and max loss less queues supported for each
stack unit. For
the pfc-buffering change to take effect, please save the
config and reload the
system.
Dell(conf)#end
Dell#00:02:38: %STKUNIT0-M:CP %SYS-5-CONFIG_I: Configured from
console
Dell#write memory
00:02:41: %STKUNIT0-M:CP %FILEMGR-5-FILESAVED: Copied running-
config to
```

```
startup-config in flash by default
Dell#reload
Proceed with reload [confirm yes/no]: yes
syncing disks... done
unmounting file systems...
unmounting /f10/flash (/dev/ld0e)...
unmounting /usr (mfs:31)...
unmounting /lib (mfs:23)...
unmounting /f10 (mfs:20)...
unmounting /tmp (mfs:15)...
unmounting /kern (kernfs)...
unmounting / (/dev/md0a)... done
rebooting...
Dell#show dcb stack-unit 0 port-set 0
stack-unit 0 port-set 0
DCB Status : Enabled
PFC Port Count : 56 (current), 56 (configured)
PFC Queue Count : 2 (current), 2 (configured)
Dell#
```

dcb <ets | pfc> enable

Enable priority flow control or enhanced transmission selection on interface.

Syntax `dcb <ets | pfc> enablepfc >enable`

- To disable ETS on interface, use "**no dcb ets enable**" command.
- To disable PFC on interface, use "**no dcb pfc enable**" command.

Defaults Enable

Command Modes INTERFACE

Command History

Version 9.5(0.0)	Supported on the M I/O aggregator.

Usage Information PFC and ETS are enabled by default on the interfaces when DCB is globally enabled (refer to dcb enable). In some network topology, you may want to disable PFC on an interface and apply link level flow control; Similarly you may want to disable ETS on an interface and apply QoS bandwidth configurations.

Limitations

- `dcb-map` command on interface is mutually exclusive to `no dcb ets enable` and `no dcb pfc enable`.
- `pfc priority` command is mutually exclusive to `no dcb pfc enable` command.
- Deprecated commands `dcb-policy input` and `no dcb pfc enable` cannot coexist at interface level.
- Deprecated commands `dcb-policy output` and `no dcb ets enable` cannot coexist at interface level.

Related Commands	dcb-map — applies dcb-map profile on interface.

dcb-map

Create a DCB map to configure priority flow control (PFC) and enhanced transmission selection (ETS) on Ethernet ports that support converged Ethernet traffic. Apply the DCB map to an Ethernet interface.

I/O Aggregator

Syntax

```
dcb-map map-name
```

Parameters

map-name	Enter a DCB map name. The maximum number of alphanumeric characters is 32.

Defaults

None. There are no pre-configured PFC and ETS settings on S5000 Ethernet interfaces.

Command Modes

CONFIGURATION

INTERFACE

Command History

Version 9.3(0.0)	Introduced on the FC Flex IO module installed in the M I/O Aggregator.

Usage Information

A DCB map is a template used to configure DCB parameters and apply them on converged Ethernet interfaces. DCB parameters include priority-based flow control (PFC) and enhanced traffic selection (ETS).

To display the PFC and ETS settings in DCB maps, enter the `show qos dcb-map` command.

Use the `dcb-map` command to create a DCB map to specify PFC and ETS settings and apply it on Ethernet ports. After you apply a DCB map to an interface, the PFC and ETS settings in the map are applied when the Ethernet port is enabled. DCBx is enabled on Ethernet ports by default.

The `dcb-map` command is supported only on physical Ethernet interfaces.

To remove a DCB map from an interface, enter the `no dcb-map map-name` command in Interface configuration mode.

Related Commands

show qos dcb-map– displays the dcb-map profiles configured on the system.

dcb-map stack-unit all stack-ports all– applies a DCB map on all ports of a switch stack.

dcbx version

Configure the DCBX version used on the interface.

Syntax

`dcbx version {auto | cee | cin | ieee-v2.5}`

To remove the DCBX version, use the `no dcbx version {auto | cee | cin | ieee-v2.5}` command.

Parameters

auto | cee | cin | ieee-v2.5

Enter the DCBX version type used on the interface, where:

- `auto`: configures the port to operate using the DCBX version received from a peer.
- `cee`: configures the port to use CEE (Intel 1.01).
- `cin`: configures the port to use Cisco-Intel-Nuova (DCBX 1.0).
- `ieee-v2.5`: configures the port to use IEEE 802.1az (Draft 2.5).

Defaults

Auto

Command Modes

PROTOCOL LLDP

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

DCBX requires that you enable LLDP to advertise DCBX TLVs to peers.

Configure DCBX operation at the INTERFACE level on a switch or globally on the switch. To verify the DCBX configuration on a port, use the `show interface dcbx detail` command.

qos-policy-output ets

To configure the ETS bandwidth allocation and scheduling for priority traffic, create a QoS output policy.

Syntax

`qos-policy-output` *`policy-name`* `ets`

To remove the QoS output policy, use the `no qos-policy-output ets` command.

Parameters

policy-name

Enter the policy name. The maximum is 32 characters.

Command Modes

CONFIGURATION

Command History	**Version 9.2(0.0)**	Supported on the M I/O Aggregator.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information

This command is supported in Programmable-Mux (PMUX) mode only.

If an error occurs in an ETS output-policy configuration, the configuration is ignored and the scheduler and bandwidth allocation settings are reset to the ETS default values (all priorities are in the same ETS priority group and bandwidth is allocated equally to each priority).

If an error occurs when a port receives a peer's ETS configuration, the port's configuration is reset to the previously configured ETS output policy. If no ETS output policy was previously applied, the port is reset to the default ETS parameters.

You can only associate output QoS policy profiles with the priority groups in the DCB output profile context; output QoS policy profiles are not permitted on output policy-maps.

Weighted random early detection (WRED), Explicit congestion notification (ECN), rate shaping, and rate limiting are not supported in output policies because DCBx does not negotiate these parameters with peer devices. You can apply a QoS output policy with WRED and/or rate shaping on a DCBx CIN-enabled interface (refer to Configuring Port-Based Rate Shaping and Weighted Random Early Detection).

Related Commands

- `scheduler` — schedules the priority traffic in port queues.
- `bandwidth-percentage` — bandwidth percentage allocated to the priority traffic in port queues.

show dcb

Displays the data center bridging status, the number of PFC-enabled ports, and the number of PFC-enabled queues.

Syntax `show dcb [stack-unit unit-number]`

Parameters

unit number	Enter the DCB unit number. The range is from 0 to 5.

Command Modes EXEC Privilege

Command History	**Version 8.3.17.0**	Supported on M I/O Aggregator.

Usage Information	Specify a stack-unit number on the Master switch in a stack.

Example	`Dell# show dcb`
	`stack-unit 0 port-set 0`
	`DCB Status : Enabled`
	`PFC Port Count : 56 (current), 56 (configured)`
	`PFC Queue Count : 2 (current), 2 (configured)`

show interface dcbx detail

Displays the DCBX configuration on an interface.

Syntax `show interface` *port-type slot/port* `dcbx detail`

Parameters

port-type	Enter the port type.
slot/port	Enter the slot/port number.

Command Modes EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information The following describes the `show interface dcbx detail` command shown in the following example.

Field	Description
Interface	Interface type with chassis slot and port number.
Port-Role	Configured DCBX port role: auto-upstream or auto-downstream.
DCBX Operational Status	Operational status (enabled or disabled) used to elect a configuration source and internally propagate a DCB configuration. The DCBX operational status is the combination of PFC and ETS operational status.
Configuration Source	Specifies whether the port serves as the DCBX configuration source on the switch: true (yes) or false (no).
Local DCBX Compatibility mode	DCBX version accepted in a DCB configuration as compatible. In auto-detection mode, a port can only operate on a DCBX version supported on the remote peer.
Local DCBX Configured mode	DCBX version configured on the port: CEE, CIN, IEEE v2.5, or Auto (port auto-configures to use the DCBX version received from a peer).

Field	Description
Peer Operating version	DCBX version that the peer uses to exchange DCB parameters.
Local DCBX TLVs Transmitted	Transmission status (enabled or disabled) of advertised DCB TLVs (see TLV code at the top of the show command output).
Local DCBX Status: DCBX Operational Version	DCBX version advertised in Control TLVs.
Local DCBX Status: DCBX Max Version Supported	Highest DCBX version supported in Control TLVs.
Local DCBX Status: Sequence Number	Sequence number transmitted in Control TLVs.
Local DCBX Status: Acknowledgment Number	Acknowledgement number transmitted in Control TLVs.
Local DCBX Status: Protocol State	Current operational state of the DCBX protocol: Waiting for ACK or IN-SYNC.
Peer DCBX Status: DCBX Operational Version	DCBX version advertised in Control TLVs received from the peer device.
Peer DCBX Status: DCBX Max Version Supported	Highest DCBX version supported in Control TLVs received from the peer device.
Peer DCBX Status: Sequence Number	Sequence number transmitted in Control TLVs received from the peer device.
Peer DCBX Status: Acknowledgment Number	Acknowledgement number transmitted in Control TLVs received from the peer device.
Total DCBX Frames transmitted	Number of DCBX frames sent from the local port.
Total DCBX Frames received	Number of DCBX frames received from the remote peer port.
Total DCBX Frame errors	Number of DCBX frames with errors received.

Field	Description
Total DCBX Frames unrecognized	Number of unrecognizable DCBX frames received.
PFC TLV Statistics	
Input PFC TLV pkts	Number of PFC TLVs received.
Output PFC TLV pkts	Number of PFC TLVs transmitted.
Error PFC pkts	Number of PFC error packets received.
PFC Pause TX pkts	Number of PFC pause frames transmitted.
PFC Pause Rx pkts	Number of PFC pause frames received.
PG TLV Statistics:	
Input PG TLV pkts	Number of PG TLVs received.
Output PG TLV pkts	Number of PG TLVs transmitted.
Error PG TLV pkts	Number of PG error packets received.
Application Priority TLV Statistics	
Input Appln Priority TLV	Number of Application TLVs received.
Output Appln Priority TLV pkts	Number of Application TLVs transmitted.
Error Appln Priority TLV	Number of Application TLV error packets received.

Example

```
Dell#show int te 0/34 dcbx detail
E-ETS Configuration TLV enabled             e-ETS
Configuration TLV disabled
R-ETS Recommendation TLV enabled            r-ETS
Recommendation TLV disabled
P-PFC Configuration TLV enabled             p-PFC
Configuration TLV disabled
F-Application priority for FCOE enabled     f-Application
Priority for FCOE
disabled
I-Application priority for iSCSI enabled    i-Application
Priority for iSCSI
disabled
-------------------------------------------------------------------
----------------
-----------
Interface TenGigabitEthernet 0/34
Port Role is Auto-Upstream
DCBX Operational Status is Disabled
Reason: Port Shutdown
```

```
Is Configuration Source? FALSE
Local DCBX Compatibility mode is IEEEv2.5
Local DCBX Configured mode is IEEEv2.5
Peer Operating version is Not Detected
Local DCBX TLVs Transmitted: ErPfi
0 Input PFC TLV pkts, 0 Output PFC TLV pkts, 0 Error PFC pkts
0 PFC Pause Tx pkts, 0 Pause Rx pkts
0 Input ETS Conf TLV pkts, 0 Output ETS Conf TLV pkts, 0 Error
ETS Conf TLV
pkts
0 Input ETS Reco TLV pkts, 0 Output ETS Reco TLV pkts, 0 Error
ETS Reco TLV
pkts
0 Input Appln Priority TLV pkts, 0 Output Appln Priority TLV
pkts, 0 Error
Appln Priority TLV pkts
Total DCBx Frames transmitted 0
Total DCBx Frames received 0
Total DCBx Frames errors 0
Total DCBx Frames unrecognized 0
Dell#
```

show interface ets

Displays the ETS configuration applied to egress traffic on an interface, including priority groups with priorities and bandwidth allocation.

Syntax

```
show interface port-type slot/port ets {summary | detail}
```

Parameters

***port-type slot/port* ets**	Enter the port-type slot and port ETS information.
{summary | detail}	Enter the keyword `summary` for a summary list of results or enter the keyword `detail` for a full list of results.

Command Modes

EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

To clear ETS TLV counters, use the `clear ets counters interface` *`port-type slot/port`* command.

The following describes the `show interface summary` command shown in the following example.

Field	Description
Interface	Interface type with stack-unit and port number.
Max Supported TC Group	Maximum number of priority groups supported.

Field	Description
Number of Traffic Classes	Number of 802.1p priorities currently configured.
Admin mode	ETS mode: on or off. When on, the scheduling and bandwidth allocation configured in an ETS output policy or received in a DCBX TLV from a peer can take effect on an interface.
Admin Parameters	ETS configuration on local port, including priority groups, assigned dot1p priorities, and bandwidth allocation.
Remote Parameters	ETS configuration on remote peer port, including admin mode (enabled if a valid TLV was received or disabled), priority groups, assigned dot1p priorities, and bandwidth allocation. If ETS admin mode is enabled on the remote port for DCBX exchange, the Willing bit received in ETS TLVs from the remote peer is included.
Local Parameters	ETS configuration on local port, including admin mode (enabled when a valid TLV is received from a peer), priority groups, assigned dot1p priorities, and bandwidth allocation.
Operational status (local port)	Port state for current operational ETS configuration: • `Init`: Local ETS configuration parameters were exchanged with the peer. • `Recommend`: Remote ETS configuration parameters were received from the peer. • `Internally propagated`: ETS configuration parameters were received from the configuration source.
ETS DCBX Oper status	Operational status of the ETS configuration on the local port: match or mismatch.
State Machine Type	Type of state machine used for DCBX exchanges of ETS parameters: Feature — for legacy DCBX versions; Asymmetric — for an IEEE version.
Conf TLV Tx Status	Status of ETS Configuration TLV advertisements: enabled or disabled.
Reco TLV Tx Status	Status of ETS Recommendation TLV advertisements: enabled or disabled
ETS TLV Statistic: Input Conf TLV pkts	Number of ETS Configuration TLVs received.
ETS TLV Statistic: Output Conf TLV pkts	Number of ETS Configuration TLVs transmitted.

Field	Description
ETS TLV Statistic: Error Conf TLV pkts	Number of ETS Error Configuration TLVs received.
ETS Reco TLV Statistic: Input Reco TLV pkts	Number of ETS Recommendation TLVs received.
ETS Reco TLV Statistic: Output Reco TLV pkts	Number of ETS Recommendation TLVs transmitted.
ETS Reco TLV Statistic: Error Reco TLV pkts	Number of ETS Error Recommendation TLVs received.

Example (Detail)

```
Dell#show interface tengigabitethernet 1/1 ets detail

Interface TenGigabitEthernet 1/1
Max Supported TC Groups is 4
Number of Traffic Classes is 8
Admin mode is on
Admin Parameters:
------------------
Admin is enabled
TC-grp     Priority#     Bandwidth     TSA
-----------------------------------------------
0       0,1,2,3,4,5,6,7   100%        ETS
1                          -           -
2                          -           -
3                          -           -
4                          -           -
5                          -           -
6                          -           -
7                          -           -
Remote Parameters :
-------------------
Remote is disabled

Local Parameters :
------------------

Local is enabled

TC-grp Priority#        Bandwidth     TSA
-----------------------------------------------
0     0,1,2,3,4,5,6,7     100%       ETS
1                          -          -
2                          -          -
3                          -          -
4                          -          -
5                          -          -
6                          -          -
7                          -          -
Oper status is internally propagated
ETS DCBX Oper status is Down
Reason: Port Shutdown
State Machine Type is Asymmetric
```

```
Conf TLV Tx Status is enabled
Reco TLV Tx Status is enabled

0 Input Conf TLV Pkts, 0 Output Conf TLV Pkts, 0 Error Conf
TLV Pkts
0 Input Reco TLV Pkts, 0 Output Reco TLV Pkts, 0 Error Reco
TLV Pkts

Dell#
```

show interface pfc

Displays the PFC configuration applied to ingress traffic on an interface, including priorities and link delay.

Syntax `show interface` *port-type slot/port* `pfc {summary | detail}`

Parameters

port-type slot/ port pfc	Enter the port-type slot and port PFC information.
{summary | detail}	Enter the keyword `summary` for a summary list of results or enter the keyword `detail` for a full list of results.

Command Modes EXEC Privilege

Command History

Version 8.3.17	Supported on the M I/O Aggregator.

Usage Information The following describes the `show interface pfc summary` field descriptions.

Field	Description
Interface	Interface type with stack-unit and port number.
Admin mode is on, Admin is enabled	PFC mode: on or off. Priority list: list of the configured PFC priorities (if any). When the PFC admin mode is on, PFC advertisements are enabled to be sent and received from peers.
Remote is enabled, Priority list, Remote Willing Status is enabled	Remote Admin mode: (enabled if a valid TLV was received or disabled). Priority list: list of the configured PFC priorities (if any). Remote Willing Status: Willing bit received in PFC TLVs from the remote peer.
Local is enabled	Local PFC configuration including the mode and the list of PFC priorities configured.
Operational status (local port)	Port state for current operational PFC configuration: • `Init`: Local PFC configuration parameters were exchanged with the peer.

Field	Description
	• `Recommend`: Remote PFC configuration parameters were received from the peer. • `Internally propagated`: PFC configuration parameters were received from the configuration source.
PFC DCBX Oper status	Operational status for the exchange of the PFC configuration on the local port: match (up) or mismatch (down).
State Machine Type	Type of state machine used for DCBX exchanges of the PFC parameters: Feature — for legacy DCBX versions; Symmetric — for an IEEE version.
TLV Tx Status	Status of the PFC TLV advertisements: enabled or disabled.
PFC Link Delay	Link delay (in quanta) used to pause specified priority traffic.
Application Priority TLV: FCOE TLV Tx Status	Status of FCoE advertisements in application priority TLVs from the local DCBX port: enabled or disabled.
Application Priority TLV: SCSI TLV Tx Status	Status of ISCSI advertisements in application priority TLVs from the local DCBX port: enabled or disabled.
Application Priority TLV: Local FCOE Priority Map	Priority bitmap used by the local DCBX port in FCoE advertisements in application priority TLVs.
Application Priority TLV: Local ISCSI Priority Map	Priority bitmap used by the local DCBX port in ISCSI advertisements in application priority TLVs.
Application Priority TLV: Remote FCOE Priority Map	Priority bitmap received from the remote DCBX port in FCoE advertisements in application priority TLVs.
Application Priority TLV: Remote ISCSI Priority Map	Priority bitmap received from the remote DCBX port in iSCSI advertisements in application priority TLVs.
PFC TLV Statistics: Input TLV pkts	Number of PFC TLVs received.
PFC TLV Statistics: Output TLV pkts	Number of PFC TLVs transmitted.
PFC TLV Statistics: Error pkts	Number of PFC error packets received.
PFC TLV Statistics: Pause Tx pkts	Number of PFC pause frames transmitted.

Field	Description
PFC TLV Statistics: Pause Rx pkts	Number of PFC pause frames received.
Input Appln Priority TLV	Number of Application Priority TLVs received.
Output Appln Priority TLV pkts	Number of Application Priority TLVs transmitted.
Error Appln Priority TLV	Number of Application Priority error packets received.

Example (detail)

```
Dell# show interfaces tengigabitethernet 0/49 pfc detail
Interface TenGigabitEthernet 0/49
  Admin mode is on
  Admin is enabled
  Remote is enabled
  Remote Willing Status is enabled
  Local is enabled
  Oper status is recommended
  PFC DCBX Oper status is Up
  State Machine Type is Feature
  TLV Tx Status is enabled
  PFC Link Delay 45556 pause quanta
  Application Priority TLV Parameters :
  --------------------------------------
 FCOE TLV Tx Status is disabled
 ISCSI TLV Tx Status is disabled
 Local FCOE PriorityMap is 0x8
 Local ISCSI PriorityMap is 0x10
 Remote FCOE PriorityMap is 0x8
 Remote ISCSI PriorityMap is 0x8

 0 Input TLV pkts, 1 Output TLV pkts, 0 Error pkts, 0 Pause Tx
pkts, 0 Pause
Rx pkts
 0 Input Appln Priority TLV pkts, 1 Output Appln Priority TLV
pkts, 0 Error
 Appln Priority TLV Pkts
```

show interface pfc statistics

Displays counters for the PFC frames received and transmitted (by dot1p priority class) on an interface.

Syntax

```
show interface port-type slot/port pfc statistics
```

Parameters

port-type	Enter the port type.
slot/port	Enter the slot/port number.

Command Modes

EXEC Privilege

Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

Example (Summary)

```
Dell#show interfaces te 0/3 pfc statistics
Interface TenGigabitEthernet 0/3

Priority Rx XOFF Frames Rx Total Frames  Tx Total Frames
-----------------------------------------------------------
0        0              0               0
1        0              0               0
2        0              0               0
3        0              0               0
4        0              0               0
5        0              0               0
6        0              0               0
7        0              0               0
```

show qos dcb-map

Display the DCB parameters configured in a specified DCB map.

FC Flex IO Modules with I/O Aggregator

Syntax

```
show qos dcb-map map-name
```

Parameters

map-name	Displays the PFC and ETS parameters configured in the specified map.

Command Modes

- EXEC
- EXEC Privilege

Command History	**Version 9.3(0.0)**	Introduced on the FC Flex IO module installed in the M I/O Aggregator.

Usage Information

Use the `show qos dcb-map` command to display the enhanced transmission selection (ETS) and priority-based flow control (PFC) parameters used to configure server-facing Ethernet ports. S5000 Ethernet ports are DCBx-enabled by default.

The following table describes the `show qos dcb-map` output shown in the example below.

Field	Description
State	Complete: All mandatory DCB parameters are correctly configured. In progress: The DCB map configuration is not complete. Some mandatory parameters are not configured.

Field	Description
PFC Mode	PFC configuration in DCB map: On (enabled) or Off.
PG	Priority group configured in the DCB map.
TSA	Transmission scheduling algorithm used by the priority group: Enhanced Transmission Selection (ETS).
BW	Percentage of bandwidth allocated to the priority group.
PFC	PFC setting for the priority group: On (enabled) or Off.
Priorities	802.1p priorities configured in the priority group.

Example

```
Dell# show qos dcb-map dcbmap2

State   :Complete
PfcMode:ON
--------------------
PG:0 TSA:ETS  BW:50  PFC:OFF
Priorities:0 1 2 4 5 6 7


PG:1 TSA:ETS  BW:50  PFC:ON
Priorities:3
```

Related Commands

dcb-map — creates a DCB map to configure PFC and ETS parameters and applies the PFC and ETS settings on Ethernet ports.

8

Dynamic Host Configuration Protocol

Dynamic host configuration protocol (DHCP) is an application layer protocol that dynamically assigns IP addresses and other configuration parameters to network end-stations (hosts) based on configuration policies determined by network administrators.

An Aggregator can operate as a DHCP client. As a DHCP client, the Aggregator requests an IP address from a DHCP server.

The following types of DHCP commands are described in this chapter:

- DHCP Client Commands
- Other Commands supported by DHCP Client

DHCP Client Commands

- ip address dhcp
- release dhcp interface
- renew dhcp interface
- show ip dhcp client statistics
- show ip dhcp lease

Other Commands supported by DHCP Client

- debug ip dhcp client events
- debug ip dhcp client packets

ip address dhcp

Acquire an IP address dynamically on an interface from the DHCP server.

Syntax	`ip address dhcp` To disable DHCP Client on an interface, use the `no ip address dhcp` command.	
Command Modes	INTERFACE	
Default	Enabled	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

Usage Information	In the M I/O Aggregator, the DHCP client is enabled only on the default vlan and management interface 0/0. Use the ip address command to assign a static ip address that overwrites the dynamically assigned IP address.

clear ip dhcp client statistics

Displays DHCP client statistics, including the number of DHCP messages sent and received on an interface.

Syntax `clear ip dhcp client statistics {all|interface type slot/port}`

Parameters

all	Clear DHCP client statistics on all DHCP client-enabled interfaces on the switch.
interface *type slot/port*	Clear DHCP client statistics on the specified interface. • For the management interface on the stack-unit, enter the keyword `managementethernet` followed by slot/port information. The slot and port range is 0. • For a VLAN, enter the keyword vlan followed by a number from 1 to 4094.

Command Modes	EXEC Privilege
Default	None

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

debug ip dhcp client events

Enable the display of log messages for the following events on DHCP client interfaces:

- IP address acquisition
- IP address release
- Renewal of IP address and lease time
- Release of an IP address

Syntax `debug ip dhcp client events [interface type slot/port]`

Parameters	**interface *type slot/port***	Display log messages for DHCP packets sent and received on the specified interface. • For the management interface on the stack-unit, enter the keyword `managementethernet` followed by slot/port information. The slot and port range is 0 • For a VLAN, enter the keyword `vlan` followed by a number from 1 to 4094.
Command Modes	EXEC Privilege	
Default	None	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

debug ip dhcp client packets

Enable the display of log messages for all DHCP packets sent and received on DHCP client interfaces.

Syntax	`debug ip dhcp client packets [interface` *`type slot/port`*`]`	
Parameters	**interface *type slot/port***	Display log messages for DHCP packets sent and received on the specified interface. • For the management interface on the stack-unit, enter the keyword `managementethernet` followed by slot/port information. The slot and port range is 0 • For a VLAN, enter the keyword `vlan` followed by a number from 1 to 4094.
Command Modes	EXEC Privilege	
Default	None	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

release dhcp interface

Release the dynamically-acquired IP address on an Ethernet interface while retaining the DHCP client configuration on the interface.

Syntax

```
release dhcp interface type slot/port
```

Parameters

interface type *slot/port*	• For the management interface on the stack-unit, enter the keyword management ethernet followed by slot/port information. The slot and port range is 0. • For a VLAN, enter the keyword vlan followed by a number from 1 to 4094.

Command Modes EXEC Privilege

Default None

Command History

Version 9.2 (0.0)	Supported on the M I/O Aggregator.

Usage Information When you enter the `release dhcp` command, although the IP address that was dynamically-acquired from a DHCP server is released from an interface, the ability to acquire a new DHCP server-assigned address remains in the running configuration for the interface. To acquire a new IP address, enter either the `renew dhcp` command at the EXEC privilege level or the `ip address dhcp` command at the interface configuration level.

renew dhcp interface

Re-acquire a dynamic IP address on an Ethernet interface enabled as a DHCP client.

Syntax

```
renew dhcp interface type slot/port}
```

Parameters

interface *type slot/port*	Enter any of the following keywords and slot/port or number to clear counters from a specified interface: • For the management interface on the stack-unit, enter the keyword `managementethernet` followed by slot/port information. The slot and port range is 0. • For a VLAN, enter the keyword vlan followed by a number from 1 to 4094.

Command Modes EXEC Privilege

Default	None.	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.
Usage information	The `renew dhcp` command is used to renew the lease of IP address obtained through dhcp. To display the currently configure dynamic IP address and lease time, enter the `show ip dhcp lease` command.	

show ip dhcp client statistics

Displays DHCP client statistics, including the number of DHCP messages sent and received on an interface.

Syntax	`show ip dhcp client statistics {all | interface` *`type slot/port`*`}`	
Parameters	**all**	Display DHCP client statistics on all DHCP client-enabled interfaces on the switch.
	interface type *slot/port*	Display DHCP client statistics on the specified interface. • For the management interface on the stack-unit, enter the keyword `management ethernet` followed by slot/port information. The slot and port range is 0. • For a VLAN, enter the keyword vlan followed by a number from 1 to 4094.
Command Modes	EXEC Privilege	
Default	None.	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

show ip dhcp lease

Displays lease information about the dynamic IP address currently assigned to a DHCP client-enabled interface.

Syntax	`show ip dhcp lease[interface` *`type slot/port`*`]`	
Parameters	**interface type** *slot/port*	Display DHCP client statistics on the specified interface.

- For the management interface on the stack-unit, enter the keyword `management ethernet` followed by slot/port information. The slot and port range is 0.
- For a VLAN, enter the keyword vlan followed by a number from 1 to 4094.

Command Modes	EXEC Privilege
Default	Display DHCP lease information on all DHCP client-enabled interfaces on the switch.
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.

9

FIP Snooping

In a converged Ethernet network, an Aggregator can operate as an intermediate Ethernet bridge to snoop on Fibre Channel over Ethernet Initialization Protocol (FIP) packets during the login process on Fibre Channel over Ethernet (FCoE) forwarders (FCFs). Acting as a transit FIP snooping bridge, the switch uses dynamically-created ACLs to permit only authorized FCoE traffic to be transmitted between an FCoE end-device and an FCF.

FIP Snooping Commands

The following Dell Networking OS commands are used to configure and verify the FIP snooping feature:

- debug fip-snooping
- show fip-snooping config
- show fip-snooping enode
- show fip-snooping fcf
- show fip-snooping sessions
- show fip-snooping statistics
- show fip-snooping system

show fip-snooping statistics

Displays statistics on the FIP packets snooped on all interfaces, including VLANs, physical ports, and port channels..

Syntax

```
show fip-snooping statistics [interface vlan vlan-id |
interface port-type port/slot | interface port-channel port-
channel-number]
```

Parameters

vlan-id	Enter the VLAN ID of the FIP packet statistics to be displayed.
port-type port/slot	Enter the port-type and slot number of the FIP packet statistics to be displayed.
port-channel-number	Enter the port channel number of the FIP packet statistics to be displayed.

Command Modes

- EXEC
- EXEC Privilege

Command History	Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

The following describes the `show fip-snooping statistics` command shown in the following example.

Field	Description
Number of Vlan Requests	Number of FIP-snooped VLAN request frames received on the interface.
Number of VLAN Notifications	Number of FIP-snooped VLAN notification frames received on the interface
Number of Multicast Discovery Solicits	Number of FIP-snooped multicast discovery solicit frames received on the interface.
Number of Unicast Discovery	Number of FIP-snooped unicast discovery solicit frames received on the interface.
Number of FLOGI	Number of FIP-snooped FLOGI request frames received on the interface.
Number of FDISC	Number of FIP-snooped FDISC request frames received on the interface
Number of FLOGO	Number of FIP-snooped FLOGO frames received on the interface
Number of ENode Keep Alives	Number of FIP-snooped ENode keep-alive frames received on the interface
Number of VN Port Keep Alives	Number of FIP-snooped VN port keep-alive frames received on the interface
Number of Multicast Discovery Advertisements	Number of FIP-snooped multicast discovery advertisements received on the interface
Number of Unicast Discovery Advertisements	Number of FIP-snooped unicast discovery advertisements received on the interface
Number of FLOGI Accepts	Number of FIP FLOGI accept frames received on the interface

Field	Description
Number of FLOGI Rejects	Number of FIP FLOGI reject frames received on the interface
Number of FDISC Accepts	Number of FIP FDISC accept frames received on the interface
Number of FDISC Rejects	Number of FIP FDISC reject frames received on the interface
Number of FLOGO Accepts	Number of FIP FLOGO accept frames received on the interface
Number of FLOGO Rejects	Number of FIP FLOGO reject frames received on the interface
Number of CVLs	Number of FIP clear virtual link frames received on the interface
Number of FCF Discovery	Number of FCF discovery timeouts that occurred on the interface
Number of VN Port Session	Number of VN port session timeouts that occurred on the interface
Number of Session failures due to Hardware Config	Number of session failures due to hardware configuration that occurred on the interface

Example

```
Dell# show fip-snooping statistics interface vlan 100
Number of Vlan Requests                                 :0
Number of Vlan Notifications                            :0
Number of Multicast Discovery Solicits                  :2
Number of Unicast Discovery Solicits                    :0
Number of FLOGI                                         :2
Number of FDISC                                         :16
Number of FLOGO                                         :0
Number of Enode Keep Alive                              :9021
Number of VN Port Keep Alive                            :3349
Number of Multicast Discovery Advertisement             :4437
Number of Unicast Discovery Advertisement               :2
Number of FLOGI Accepts                                 :2
Number of FLOGI Rejects                                 :0
Number of FDISC Accepts                                 :16
Number of FDISC Rejects                                 :0
Number of FLOGO Accepts                                 :0
Number of FLOGO Rejects                                 :0
Number of CVL                                           :0
Number of FCF Discovery Timeouts                        :0
Number of VN Port Session Timeouts                      :0
Number of Session failures due to Hardware Config       :0
Dell(conf)#

Dell# show fip-snooping statistics int tengigabitethernet 0/11
Number of Vlan Requests                                  :1
```

```
Number of Vlan Notifications                              :0
Number of Multicast Discovery Solicits                    :1
Number of Unicast Discovery Solicits                      :0
Number of FLOGI                                           :1
Number of FDISC                                           :16
Number of FLOGO                                           :0
Number of Enode Keep Alive                                :4416
Number of VN Port Keep Alive                              :3136
Number of Multicast Discovery Advertisement               :0
Number of Unicast Discovery Advertisement                 :0
Number of FLOGI Accepts                                   :0
Number of FLOGI Rejects                                   :0
Number of FDISC Accepts                                   :0
Number of FDISC Rejects                                   :0
Number of FLOGO Accepts                                   :0
Number of FLOGO Rejects                                   :0
Number of CVL                                             :0
Number of FCF Discovery Timeouts                          :0
Number of VN Port Session Timeouts                        :0
Number of Session failures due to Hardware Config         :0
```

Example (port channel)

```
Dell# show fip-snooping statistics interface port-channel 22
Number of Vlan Requests                                   :0
Number of Vlan Notifications                              :2
Number of Multicast Discovery Solicits                    :0
Number of Unicast Discovery Solicits                      :0
Number of FLOGI                                           :0
Number of FDISC                                           :0
Number of FLOGO                                           :0
Number of Enode Keep Alive                                :0
Number of VN Port Keep Alive                              :0
Number of Multicast Discovery Advertisement               :4451
Number of Unicast Discovery Advertisement                 :2
Number of FLOGI Accepts                                   :2
Number of FLOGI Rejects                                   :0
Number of FDISC Accepts                                   :16
Number of FDISC Rejects                                   :0
Number of FLOGO Accepts                                   :0
Number of FLOGO Rejects                                   :0
Number of CVL                                             :0
Number of FCF Discovery Timeouts                          :0
Number of VN Port Session Timeouts                        :0
Number of Session failures due to Hardware Config         :0
```

debug fip-snooping

Enable the debug FIP protocol specific messages.

Syntax `debug fip-snooping [all|acl|error|ifm|info|ipc|rx]`

Parameters

all	Enable all the debug options.
acl	Enable for ACL specific debugs
error	Enable for Error specific debugs

	ifm	Enable for IFM specific debugs
	info	Enable for Information specific debugs
	ipc	Enable for IPC specific debugs
	rx	Enable for packet receive specific debugs
Command Modes	EXEC Privilege	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

show fip-snooping config

Displays the FIP snooping status and configured FC-MAP values.

Syntax

```
show fip-snooping config
```

Command Modes

- EXEC
- EXEC Privilege

Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

Example

```
Dell#show fip-snooping config
FIP Snooping Feature enabled Status: Enabled
FIP Snooping Global enabled Status: Enabled
Global FC-MAP Value: 0X0EFC00
Dell#
```

show fip-snooping enode

Displays information on the ENodes in FIP-snooped sessions, including the ENode interface and MAC address, FCF MAC address, VLAN ID, and FC-ID.

Syntax

```
show fip-snooping enode [enode-mac-address]
```

Parameters

enode-mac-address	Enter the MAC address of the ENodes to be displayed.

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

The following describes the `show fip-snooping enode` command shown in the following example.

Field	Description
ENode MAC	MAC address of the ENode
ENode Interface	Slot/ port number of the interface connected to the ENode.
FCF MAC	MAC address of the FCF
VLAN	VLAN ID number used by the session
FC-ID	Fibre Channel session ID assigned by the FCF.

Example

```
Dell# show fip-snooping enode
Enode MAC               Enode Interface          FCF
MAC              VLAN             FC-ID
---------              ---------------
-------              ----              ------   d4:ae:
52:1b:e3:cd      Te 0/11                 54:7f:ee:
37:34:40     100             62:00:11
```

show fip-snooping fcf

Displays information on the FCFs in FIP-snooped sessions, including the FCF interface and MAC address, FCF interface, VLAN ID, FC-MAP value, FKA advertisement period, and number of ENodes connected.

Syntax

```
show fip-snooping fcf[fcf-mac-address]
```

Parameters

fcf-mac-address	Enter the MAC address of the FCF to be displayed.

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

The following describes the `show fip-snooping fcf` command shown in the following example.

Field	Description
FCF MAC	MAC address of the FCF

Field	Description
FCF Interface	Slot/ port number of the interface to which the FCF is connected.
VLAN	VLAN ID number used by the session
FC-MAP	FC-MAP value advertised by the FCF.
FKA_ADV_PERIOD	Period of time (in milliseconds) during which FIP keep-alive advertisements are transmitted.
No of ENodes	Number of ENodes connected to the FCF

Example

```
Dell# show fip-snooping fcf
FCF MAC              FCF Interface    VLAN    FC-MAP
FKA_ADV_PERIOD  No. of Enodes
-------              -------------    ----     ------
--------------  -------------
54:7f:ee:37:34:40    Po 128           100     0e:fc:00
4000              1
```

show fip-snooping sessions

Displays information on FIP-snooped sessions on all VLANs or a specified VLAN, including the ENode interface and MAC address, the FCF interface and MAC address, VLAN ID, FCoE MAC address and FCoE session ID number (FC-ID), worldwide node name (WWNN) and the worldwide port name (WWPN).

Syntax `show fip-snooping sessions[interface vlan vlan-id]`

Parameters

vlan-id	Enter the vlan-id of the specified VLAN to be displayed.

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

The following describes the `show fip-snooping sessions` command shown in the following example.

Field	Description
ENode MAC	MAC address of the ENode.
ENode Interface	Slot/ port number of the interface connected to the ENode.
FCF MAC	MAC address of the FCF.
FC Interface	Slot/ port number of the interface to which the FCF is connected.

Field	Description
VLAN	VLAN ID number used by the session.
FCoE MAC	MAC address of the FCoE session assigned by the FCF.
FC-ID	Fibre Channel ID assigned by the FCF.
Port WWPN	Worldwide port name of the CNA port.
Port WWNN	Worldwide node name of the CNA port.

Example

```
Dell#show fip-snooping sessions
Enode MAC         Enode Intf      FCF MAC    FCF Intf VLAN
FCoE MAC        FC-ID
00:0e:1e:0c:54:a6 Te 0/14 00:05:73:f2:4f:ae Po128 100 0e:fc:
00:9a:00:27 9a:00:27 20:01:00:0e:1e:0c:54:a6
00:0e:1e:06:01:5e Te 0/16 00:05:73:f2:4f:af Po128 100 0e:fc:
00:9a:01:18 9a:01:18 20:01:00:0e:1e:06:01:5
Port WWNN
20:00:00:0e:1e:0c:54:a6
20:00:00:0e:1e:0c:54:a6
```

show fip-snooping statistics

Displays statistics on the FIP packets snooped on all interfaces, including VLANs, physical ports, and port channels..

Syntax

```
show fip-snooping statistics [interface vlan vlan-id |
interface port-type port/slot | interface port-channel port-
channel-number]
```

Parameters

vlan-id	Enter the VLAN ID of the FIP packet statistics to be displayed.
port-type port/slot	Enter the port-type and slot number of the FIP packet statistics to be displayed.
port-channel-number	Enter the port channel number of the FIP packet statistics to be displayed.

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

The following describes the `show fip-snooping statistics` command shown in the following example.

Field	Description
Number of Vlan Requests	Number of FIP-snooped VLAN request frames received on the interface.
Number of VLAN Notifications	Number of FIP-snooped VLAN notification frames received on the interface
Number of Multicast Discovery Solicits	Number of FIP-snooped multicast discovery solicit frames received on the interface.
Number of Unicast Discovery	Number of FIP-snooped unicast discovery solicit frames received on the interface.
Number of FLOGI	Number of FIP-snooped FLOGI request frames received on the interface.
Number of FDISC	Number of FIP-snooped FDISC request frames received on the interface
Number of FLOGO	Number of FIP-snooped FLOGO frames received on the interface
Number of ENode Keep Alives	Number of FIP-snooped ENode keep-alive frames received on the interface
Number of VN Port Keep Alives	Number of FIP-snooped VN port keep-alive frames received on the interface
Number of Multicast Discovery Advertisements	Number of FIP-snooped multicast discovery advertisements received on the interface
Number of Unicast Discovery Advertisements	Number of FIP-snooped unicast discovery advertisements received on the interface
Number of FLOGI Accepts	Number of FIP FLOGI accept frames received on the interface
Number of FLOGI Rejects	Number of FIP FLOGI reject frames received on the interface
Number of FDISC Accepts	Number of FIP FDISC accept frames received on the interface

Field	Description
Number of FDISC Rejects	Number of FIP FDISC reject frames received on the interface
Number of FLOGO Accepts	Number of FIP FLOGO accept frames received on the interface
Number of FLOGO Rejects	Number of FIP FLOGO reject frames received on the interface
Number of CVLs	Number of FIP clear virtual link frames received on the interface
Number of FCF Discovery	Number of FCF discovery timeouts that occurred on the interface
Number of VN Port Session	Number of VN port session timeouts that occurred on the interface
Number of Session failures due to Hardware Config	Number of session failures due to hardware configuration that occurred on the interface

Example

```
Dell# show fip-snooping statistics interface vlan 100
Number of Vlan Requests                                :0
Number of Vlan Notifications                           :0
Number of Multicast Discovery Solicits                 :2
Number of Unicast Discovery Solicits                   :0
Number of FLOGI                                        :2
Number of FDISC                                        :16
Number of FLOGO                                        :0
Number of Enode Keep Alive                             :9021
Number of VN Port Keep Alive                           :3349
Number of Multicast Discovery Advertisement            :4437
Number of Unicast Discovery Advertisement              :2
Number of FLOGI Accepts                                :2
Number of FLOGI Rejects                                :0
Number of FDISC Accepts                                :16
Number of FDISC Rejects                                :0
Number of FLOGO Accepts                                :0
Number of FLOGO Rejects                                :0
Number of CVL                                          :0
Number of FCF Discovery Timeouts                       :0
Number of VN Port Session Timeouts                     :0
Number of Session failures due to Hardware Config      :0
Dell(conf)#

Dell# show fip-snooping statistics int tengigabitethernet 0/11
Number of Vlan Requests                                 :1
Number of Vlan Notifications                            :0
Number of Multicast Discovery Solicits                  :1
Number of Unicast Discovery Solicits                    :0
Number of FLOGI                                         :1
Number of FDISC                                         :16
Number of FLOGO                                         :0
```

```
Number of Enode Keep Alive                                  :4416
Number of VN Port Keep Alive                                :3136
Number of Multicast Discovery Advertisement                 :0
Number of Unicast Discovery Advertisement                   :0
Number of FLOGI Accepts                                     :0
Number of FLOGI Rejects                                     :0
Number of FDISC Accepts                                     :0
Number of FDISC Rejects                                     :0
Number of FLOGO Accepts                                     :0
Number of FLOGO Rejects                                     :0
Number of CVL                                               :0
Number of FCF Discovery Timeouts                            :0
Number of VN Port Session Timeouts                          :0
Number of Session failures due to Hardware Config           :0
```

Example (port channel)

```
Dell# show fip-snooping statistics interface port-channel 22
Number of Vlan Requests                                     :0
Number of Vlan Notifications                                :2
Number of Multicast Discovery Solicits                      :0
Number of Unicast Discovery Solicits                        :0
Number of FLOGI                                             :0
Number of FDISC                                             :0
Number of FLOGO                                             :0
Number of Enode Keep Alive                                  :0
Number of VN Port Keep Alive                                :0
Number of Multicast Discovery Advertisement                 :4451
Number of Unicast Discovery Advertisement                   :2
Number of FLOGI Accepts                                     :2
Number of FLOGI Rejects                                     :0
Number of FDISC Accepts                                     :16
Number of FDISC Rejects                                     :0
Number of FLOGO Accepts                                     :0
Number of FLOGO Rejects                                     :0
Number of CVL                                               :0
Number of FCF Discovery Timeouts                            :0
Number of VN Port Session Timeouts                          :0
Number of Session failures due to Hardware Config           :0
```

show fip-snooping system

Displays information on the status of FIP snooping on the switch (enabled or disabled), including the number of FCoE VLANs, FCFs, ENodes, and currently active sessions.

Syntax

```
show fip-snooping system
```

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Example

```
Dell# show fip-snooping system
Global Mode                   : Enabled
FCOE VLAN List (Operational)  : 1, 100
FCFs                          : 1
```

```
Enodes                          : 2
Sessions                        : 17
```

10

Internet Group Management Protocol (IGMP)

The Dell Networking OS supports IGMP snooping version 2 and 3 on all Dell Networking systems.

IGMP Commands

The Dell Networking OS supports the following IGMP commands:

- clear ip igmp groups
- debug ip igmp
- ip igmp snooping flood
- show ip igmp groups
- show ip igmp interface
- show ip igmp snooping mrouter

Important Points to Remember

- Dell Networking OS supports version 1, version 2, and version 3 hosts.
- Dell Networking OS IGMP snooping implementation is based on IP multicast address (not based on Layer 2 multicast mac-address) and the IGMP snooping entries are in Layer 3 flow table not in Layer 2 forwarding information base (FIB).
- Dell Networking OS IGMP snooping implementation is based on draft-ietf-magma-snoop-10.
- IGMP snooping is supported on all M I/O Aggregator stack members.
- IGMP snooping is enabled by default on the switch.
- A maximum of 8k groups and 4k virtual local area networks (VLAN) are supported.
- IGMP snooping is not supported on default VLAN interface.
- Flooding of unregistered multicast traffic is enabled by default.
- Queries are not accepted from the server side ports and are only accepted from the uplink LAG.
- Reports and Leaves are flooded by default to the uplink LAG irrespective of whether it is an mrouter port or not.

clear ip igmp groups

Clear entries from the group cache table.

Syntax `clear ip igmp groups [group-address | interface]`

Parameters	**group-address**	(OPTIONAL) Enter the IP multicast group address in dotted decimal format.
	interface	(OPTIONAL) Enter the interface type and slot/port information:For a VLAN interface enter the keyword vlan followed by a number from 1 to 4094.
Command Modes	EXEC Privilege	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

debug ip igmp

Enable debugging of IGMP packets.

Syntax	`debug ip igmp [group address | interface]` To disable IGMP debugging, enter the `no ip igmp` command. To disable all debugging, enter the `undebug all` command.
Defaults	Disabled

Parameters	**group-address**	(OPTIONAL) Enter the IP multicast group address in dotted decimal format.
	interface	(OPTIONAL) Enter the interface type and slot/port information: For a VLAN interface enter the keyword vlan followed by a number from 1 to 4094.
Command Modes	EXEC Privilege	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

ip igmp snooping flood

This command controls the flooding behavior of unregistered multicast data packets.When flooding is disabled, unregistered multicast data traffic is forwarded to *only* multicast router ports in a VLAN. If there is no multicast router port in a VLAN, unregistered multicast data traffic is dropped.

Syntax	`ip igmp snooping flood`
Parameters	Enabled
Command Modes	CONFIGURATION

Command History	Version 8.3.17.0	Supported on the M I/O Aggregator.

show ip igmp groups

View the IGMP groups.

Syntax

```
show ip igmp groups [group-address [detail] | detail |
interface [group-address [detail]]]
```

Parameters

group-address	(OPTIONAL) Enter the group address in dotted decimal format to view information on that group only.
interface	(OPTIONAL) Enter the interface type and slot/port information: For a VLAN interface enter the keyword vlan followed by a number from 1 to 4094.
detail	(OPTIONAL) Enter the keyword detail to display the IGMPv3 source information.

Command Modes

- EXEC
- EXEC Privilege

Command History	Version 8.3.17.0	Supported on the M I/O Aggregator.

Example

```
Dell#show ip igmp groups
Total Number of Groups: 5
IGMP Connected Group Membership
Group Address Interface Mode Uptime
Expires Last Reporter
225.0.0.0 Vlan 100 IGMPv2 00:00:05
00:02:04 3.0.0.51
Member Ports: Po 2
225.0.0.2 Vlan 100 IGMPv2 00:00:05
00:02:04 3.0.0.51
Member Ports: Po 2
225.0.0.3 Vlan 100 IGMPv2 00:00:05
00:02:04 3.0.0.51
Member Ports: Po 2
225.0.0.4 Vlan 100 IGMPv2 00:00:05
00:02:04 3.0.0.51
Member Ports: Po 2
```

Field	Description
Group Address	Lists the multicast address for the IGMP group.
Interface	Lists the interface type, slot and port number.

Mode	Displays the IGMP version used.
Uptime	Displays the amount of time the group has been operational.
Expires	Displays the amount of time until the entry expires.
Last Reporter	Displays the IP address of the last host to be a member of the IGMP group.
Member Ports	Indicates the member ports of the port channel. If the port channel is VLT, an asterisk (*) after the port channel number indicates the port channel is locally down and that a remote VLT port is up.

show ip igmp interface

View information on the interfaces participating in IGMP.

Syntax `show ip igmp interface [interface]`

Parameters

interface (OPTIONAL) Enter any of the following keywords and slot/port or number to clear counters from a specified interface:

- For a Port Channel interface, enter the keyword port-channel followed by a number. Range: 1-128
- For a 10-Gigabit Ethernet interface, enter the keyword TenGigabitEthernet followed by the slot/port information.
- For a VLAN, enter the keyword vlan followed by a number from 1 to 4094.

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0 Supported on the M I/O Aggregator.

Example

```
Dell#show ip igmp interface
Vlan 2 is up, line protocol is down
Inbound IGMP access group is not set
Interface IGMP group join rate limit is not set
IGMP snooping is enabled on interface
IGMP Snooping query interval is 60 seconds
IGMP Snooping querier timeout is 125 seconds
IGMP Snooping last member query response interval is 1000 ms
IGMP snooping fast-leave is disabled on this interface
IGMP snooping querier is disabled on this interface
Vlan 3 is up, line protocol is down
Inbound IGMP access group is not set
```

```
Interface IGMP group join rate limit is not set
IGMP snooping is enabled on interface
IGMP Snooping query interval is 60 seconds
IGMP Snooping querier timeout is 125 seconds
IGMP Snooping last member query response interval is 1000 ms
IGMP snooping fast-leave is disabled on this interface
IGMP snooping querier is disabled on this interface
--More--
```

show ip igmp snooping mrouter

Displays multicast router interfaces.

Syntax `show ip igmp snooping mrouter [vlan number]`

Parameters

vlan *number*	Enter the keyword vlan followed by the vlan number. Range: 1 to 4094

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Example

```
Dell#show ip igmp snooping mrouter vlan 2
Interface Router Ports
Vlan 2 Po 128
Dell#
```

Related Commands show ip igmp groups — Use this IGMP command to view groups.

11

Interfaces

This chapter defines interface commands and is divided into the following sections:

- Port Interface Commands
- Port Channel Commands
- Time Domain Reflectometer (TDR) Commands

Port Interface Commands

The following commands are for physical, loopback, and null interfaces:

- clear counters
- clear mac-address-table dynamic
- interface range
- interface range macro (define)
- interface range macro name
- interface vlan
- keepalive
- monitor interface
- name
- show config (INTERFACE mode)
- show config (from INTERFACE RANGE mode)
- show config (from INTERFACE VLAN mode)
- show interfaces configured
- show interfaces description
- show interfaces stack-unit
- show interfaces port-channel
- show interfaces status
- show interfaces switchport
- show range
- show vlan
- shutdown
- speed (for 1000/10000 interfaces)

Port Channel Commands

A Link Aggregation Group (LAG) is a group of links that appear to a MAC client as if they were a single link according to IEEE 802.3ad. In Dell Networking OS, a LAG is referred to as a Port Channel.

- For the Aggregator, the maximum port channel ID is 128 and the maximum members per port channel is 16.

Because each port can be assigned to only one Port Channel, and each Port Channel must have at least one port, some of those nominally available Port Channels might have no function because they could have no members if there are not enough ports installed. In the Aggregator, stack members can provide those ports.

The commands in this section are specific to Port Channel interfaces:

- auto vlan
- group
- monitor interface
- show config (from INTERFACE RANGE mode)
- show interfaces port-channel

NOTE: The Dell Networking OS implementation of LAG or Port Channel requires that you configure a LAG on both switches manually. For information about Dell Networking OS link aggregation control protocol (LACP) for dynamic LAGs, refer to the Link Aggregation Control Protocol (LACP) chapter. For more information about configuring and using Port Channels, refer to the *Dell PowerEdge M I/O Aggregator Configuration Guide*

Time Domain Reflectometer (TDR) Commands

TDR is useful for troubleshooting an interface that is not establishing a link; either it is flapping or not coming up at all. TDR detects open or short conditions of copper cables on 100/1000/10G Base-T modules.

- tdr-cable-test
- show tdr

Important Points to Remember

- The interface and port must be enabled (configured—see the `interface` command) before running TDR. An error message is generated if you have not enabled the interface.
- The interface on the far-end device must be shut down before running TDR.
- Because TDR is an intrusive test on an interface that is not establishing a link, do not run TDR on an interface that is passing traffic.
- When testing between two devices, do not run the test on both ends of the cable.

Virtual LAN (VLAN) Commands

The following commands configure and monitor virtual local area networks (VLANs). VLANs are a virtual interface and use many of the same commands as physical interfaces.

You can configure an IP address only on the default VLAN and Layer 3 protocols on a VLAN called Inter-VLAN routing. FTP, TFTP, ACLs, and SNMP are not supported on a VLAN.

Occasionally, while sending broadcast traffic over multiple Layer 3 VLANs, state of a VLAN interface may continually switch between Master and Backup.

- auto vlan
- default vlan-id
- name
- show config (from INTERFACE VLAN mode)
- show vlan
- vlan tagged
- vlan untagged

auto vlan

Change the port to auto or admin vlan mode (enable or disable all auto VLANs).

Syntax	`auto vlan <cr>` To remove membership from 4K VLAN, use the `no auto vlan` command.	
Defaults	none	
Parameters	**description**	Enter a text string description to identify the VLAN (80 characters maximum).
Command Modes	INTERFACE	
Usasge Information	The `auto vlan` command adds the port as untagged to default vlan and tagged to all other 4094 VLAN.	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

clear counters

Clear the counters used in the `show interfaces` commands for VLANs, and physical interfaces, or selected ones.

Syntax	`clear counters` *`interface`*

Defaults Without a specific interface specified, the command clears all interface counters.

Parameters

interface (OPTIONAL) Enter any of the following keywords and slot/port or number to clear counters from a specified interface:

- For the management interface on the stack-unit, enter the keyword `management ethernet` followed by slot/port information. The slot and port range is 0.
- For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information.
- For a Port Channel interface, enter the keyword port-channel followed by a number. Range: 1-128

Command Modes EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Example

```
Dell#clear counters
Clear counters on all interfaces [confirm]
```

clear mac-address-table dynamic

Clear the MAC address table of all MAC addresses learned dynamically.

Syntax `clear mac-address-table dynamic {interface tengigabitethernet` *`slot/port-id`*`}`

Parameters

interface Enter the keyword `interface range` and one of the interfaces — slot/port, port-channel or VLAN number. Select the range of interfaces for bulk configuration. You can enter up to six comma separated ranges-spaces are not required between the commas. Comma-separated ranges can include VLANs, port-channels and physical interfaces.

Slot/Port information must contain a space before and after the dash. For example, interface range tengigabitethernet 0/1 - 5 is valid; interface range tengigabitethernet 0/1-5 is not valid.

- For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information.

Command Modes EXEC Privilege

Command History	Version 8.3.17.0	Supported on the M I/O Aggregator.

clear mac-address-table dynamic

Clear the MAC address table of all MAC addresses learned dynamically.

Syntax `clear mac-address-table dynamic {interface tengigabitethernet` *slot/port-id*`}`

Parameters

interface Enter the keyword `interface range` and one of the interfaces — slot/port, port-channel or VLAN number. Select the range of interfaces for bulk configuration. You can enter up to six comma separated ranges-spaces are not required between the commas. Comma-separated ranges can include VLANs, port-channels and physical interfaces.

Slot/Port information must contain a space before and after the dash. For example, interface range tengigabitethernet 0/1 - 5 is valid; interface range tengigabitethernet 0/1-5 is not valid.

- For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information.

Command Modes EXEC Privilege

Command History	Version 8.3.17.0	Supported on the M I/O Aggregator.

default vlan-id

Set the default VLAN-id.

Syntax `default vlan-id <`*vlan-id*`>`

To set the default VLAN-id, use the `no default vlan-id` command.

Defaults none

Command Modes CONFIGURATION

Command History	Version 8.3.17.0	Supported on the M I/O Aggregator.

Related commands	show vlan— Displays VLAN configuration.

description

Assign a descriptive text string to the interface.

Syntax	`description desc_text` To delete a description, enter `no description` command.
Parameters	***desc_text*** Enter a text string up to 240 characters long.
Defaults	No description is defined.
Command Modes	INTERFACE
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.
Usage Information	• Spaces between characters are not preserved after entering this command unless you enclose the entire description in quotation marks (“desc_text”). • Entering a text string after the `default vlan-id` command overwrites any previous text string configured as the description. • The `show tdr` and `default vlan-id` commands are the only commands that you can configure on an interface that is a member of a port-channel. • Use the `show interfaces description` command to display descriptions configured for each interface.
Related commands	show interfaces description— Displays the description field of interfaces..

group

Group two LAGs in a supergroup (“fate-sharing group” or “failover group”).

Syntax	`group group_number port-channel number port-channel number` To remove an existing LAG supergroup, use the no group *group_number* command.
Parameters	***group_number*** Enter an integer from 1 to 32 that will uniquely identify this LAG fate-sharing group.

	port-channel ***number***	Enter the keyword port-channel followed by an existing LAG *number*. Enter this keyword/variable combination twice, identifying the two LAGs to be paired.

Defaults none

Command Modes PORT-CHANNEL FAILOVER-GROUP (conf-po-failover-grp)

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Example

```
Dell(conf)#port-channel failover-group
Dell(conf-po-failover-grp)#group 1 port-channel 1 port-channel
2
Dell(conf-po-failover-grp)#
```

Related commands show interfaces port-channel— Displays information on configured Port Channel groups.

interface range

This command permits configuration of a range of interfaces to which subsequent commands are applied (bulk configuration). Using the interface range command, you can enter identical commands for a range of interface.

Syntax `interface range` *`interface, interface,...`*

To delete a description, enter `no description` command.

Parameters

interface, ***interface,...***	Enter the keyword interface range and one of the interfaces — slot/port, port-channel or VLAN number. Select the range of interfaces for bulk configuration. You can enter up to six comma separated ranges—spaces are not required between the commas. Comma-separated ranges can include VLANs, port-channels and physical interfaces. Slot/Port information must contain a space before and after the dash. For example, `interface range tengigabitethernet 0/1 - 5` is valid; `interface range tengigabitethernet` 0/1-5 is not valid. • For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information. • For a VLAN, enter the keyword `vlan` followed by a number from 1 to 4094.

Defaults	none
Command Modes	CONFIGURATION
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.
Usage Information	When creating an interface range, interfaces appear in the order they are entered; they are not sorted. The command verifies that interfaces are present (physical) or configured (logical). Important things to remember: • Bulk configuration is created if at least one interface is valid. • Non-existing interfaces are excluded from the bulk configuration with a warning message. • The interface range prompt includes interface types with slot/port information for valid interfaces. The prompt allows for a maximum of 32 characters. If the bulk configuration exceeds 32 characters, it is represented by an ellipsis (...). • When the interface range prompt has multiple port ranges, the smaller port range is excluded from the prompt. • If overlapping port ranges are specified, the port range is extended to the smallest start port and the biggest end port.

Example-Bulk Configuration Warning Message	`Dell(conf)#interface range tengig 2/0 - 1 , tengig 10/0 , tengig 3/0`
	`, fa 0/0`
	`% Warning: Non-existing ports (not configured) are ignored by interface-range`

Example-Interface Range prompt with Multiple Ports	`Dell(conf)#interface range tengig 2/0 - 23 , tengig 2/1 - 10` `Dell(conf-if-range-tengig-2/0-23#`
Example-Interface Range prompt Overlapping Port Ranges	`Dell(conf)#interface range tengig 2/1 - 11 , tengig 2/1 - 23` `Dell(conf-if-range-tengig-2/1-23#`
	Only VLAN and port-channel interfaces created using the `interface vlan` and `vlan tagged` commands can be used in the `interface range` command. Use the `show running-config` command to display the VLAN and port-channel interfaces. VLAN or port-channel interfaces that are not displayed in the `show running-config` command cannot be used with the bulk configuration feature of the `interface range` command. You cannot create virtual interfaces (VLAN, Port-channel) using the interface range command. **NOTE:** If a range has VLAN, physical, and port-channel interfaces, only commands related to physical interfaces can be bulk configured. To configure commands specific to VLAN or port-channel, only those respective interfaces should be configured in a particular range.

Example-Single Range Bulk Configuration

```
Dell(conf)# interface range tengigabitethernet 5/1 - 23
Dell(conf-if-range)# no shutdown
Dell(conf-if-range)#
```

Example-Multiple Range Bulk Configuration Gigabit Ethernet and Ten Gigabit Ethernet

The following example shows how to use commas to add different interface types to the range enabling all TenGigabit Ethernet interfaces in the range 5/1 to 5/23 and both Ten Gigabit Ethernet interfaces 1/1 and 1/2.

```
Dell(conf-if)# interface range tengigabitethernet 5/1 - 23,
tengigabitethernet 1/1 - 2
Dell(conf-if-range)# no shutdown
Dell(conf-if-range)#
```

Example-Multiple Range Bulk Configuration with VLAN and port channel

The following example shows how to use commas to add VLAN and port-channel interfaces to the range.

```
Dell(conf-if)# interface range tengigabitethernet 5/1 - 23,
tengigabitethernet 1/1 - 2,
Vlan 2 - 100 , Port 1 - 25
Dell(conf-if-range)# no shutdown
Dell(conf-if-range)#
```

Related commands

show config (from INTERFACE RANGE mode)— Shows the bulk configuration interfaces.

show interfaces status— Displays a summary of interface information.

interface range macro (define)— Defines a macro for an interface-range.

interface range macro (define)

Defines a macro for an interface range and then saves the macro in the running configuration.

Syntax

```
define interface range macroname interface, interface,...
```

Parameters

name	Enter up to 16 characters for the macro name.
interface, interface,...	Enter the `interface` keyword range and one of the interfaces — slot/port, port-channel or VLAN number. Select the range of interfaces for bulk configuration. You can enter up to six comma separated ranges—spaces are **not** required between the commas. Comma-separated ranges can include VLANs, port-channels and physical interfaces. Slot/Port information must contain a space before and after the dash. For example, `interface range tengigabitethernet 0/1 - 5` is valid; `interface range tengigabitethernet` 0/1-5 is not valid. • For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information.

- For a VLAN, enter the keyword `vlan` followed by a number from 1 to 4094.

Defaults	none
Command Modes	CONFIGURATION
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.
Usage Information	The following example shows how to define an interface range macro named *test*. To display the macro definition, execute the `show running-config` command.

Example-define interface-range macro	`Dell(conf)# define interface-range test tengigabitethernet 0/0 - 3 , tengigabitethernet 5/0 - 47 , tengigabitethernet 13/0 - 89`
	`Dell# show running-config | grep define`
	`define interface-range test tengigabitethernet 0/0 - 3 , tengigabitethernet 5/0 -`
	`47 , tengigabitethernet 13/0 - 89`
	`Dell(conf)#interface range macro test`
	`Dell(conf-if-range-te-0/0-3,te-5/0-47,te-13/0-89)#`

Related commands	group— Configures a range of command (bulk configuration) interface range macro name — Runs an interface range macro.

interface range macro name

Run the interface-range macro to automatically configure the pre-defined range of interfaces.

Syntax	`interface range macro` *name*
Parameters	***name*** Enter the name of an existing macro.
Defaults	none
Command Modes	CONFIGURATION
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.
Usage Information	The following example runs the macro named *test* that was defined earlier.
Example-interface-range macro	`Dell(conf)#interface range macro test` `Dell(conf-if-range-te-0/0-3,tengig-5/0-47,tengig-13/0-89)#`

Related commands	group — Configures a range of command (bulk configuration) interface range macro (define) — Defines a macro for an interface range (bulk configuration).

interface vlan

Configure the default VLAN to enable Static or DCHP IP configuration

Syntax	`interface vlan`*`def-vlan-id`*
Parameters	***def-vlan-id*** Enter 1 for the default VLAN.
Defaults	Not configured
Command Modes	CONFIGURATION
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.
Usage Information	For more information about VLANs and the commands to configure them, refer to Virtual LAN (VLAN) Commands.
Example	`Dell(conf)#int vlan 1` `Dell(conf-if-vl-1)#`
Related commands	show vlan — Displays the current VLAN configuration on the switch. vlan tagged — Adds a Layer 2 interface to a VLAN as a tagged interface. vlan untagged — Adds a Layer 2 interface to a VLAN as an untagged interface.

intf-type cr4 autoneg

Set the interface type as CR4 with auto-negotiation enabled.

Syntax	`intf-type cr4 autoneg` If you configure `intf-type cr4 autoneg`, use the `no intf-type cr4 autoneg` command to set the interface type as cr4 with autonegotiation disabled.
Defaults	Not configured
Command Modes	CONFIGURATION

Command History	**Version 9.0.2.0**	Introduced on the S6000.
	Version 8.3.19.0	Introduced on the S4820T.
	Version 8.3.11.1	Introduced on the Z9000.
	Version 8.3.7.0	Introduced on the S4810.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information

If you configure `interface type` as CR4 with auto-negotiation enabled, also configure CR4 with auto-negotiation. Many DAC cable link issues are resolved by setting the interface type as CR4.

Related Commands

- Interfaces — configures a physical interface.
- interface port-channel — configures a port channel group.

keepalive

Keep the interface alive when it is not transmitting data.

Syntax `keepalive`

Parameters

def-vlan-id	Enter 1 for the default VLAN.

Defaults Enabled

Command Modes INTERFACE

Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

Usage Information

When you configure `keepalive`, the system keeps the link up even if the link is not active at the time.

monitor interface

Monitor counters on a single interface or all interfaces on a stack unit. The screen is refreshed every five seconds and the CLI prompt disappears.

Syntax `monitor interface [interface]`

To disable monitoring and return to the CLI prompt, press the `q` key.

Parameters

interface	(OPTIONAL) Enter the following keywords and slot/port or number information: • For the management port, enter the keyword `managementethernet` followed by the slot (0 or 1) and the port (0). • For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information. • For a Port Channel interface, enter the keyword `port-channel` followed by a number. The range is from 1 to 4094.

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on M I/O Aggregator.

Usage Information

The delta column displays changes since the last screen refresh.

The following are the `monitor` command menu options.

Key	Description
systest-3	Displays the host name assigned to the system.
monitor time	Displays the amount of time since the `monitor interface` command was entered.
time	Displays the amount of time the chassis is up (since last reboot).
m	Change the view from a single interface to all interfaces on the stack unit or visa-versa.
c	Refresh the view.
b	Change the counters displayed from Packets on the interface to Bytes.
r	Change the [delta] column from change in the number of packets/bytes in the last interval to rate per second.
l	Change the view to the next interface on the stack unit, or if in the stack unit mode, the next stack unit in the chassis.
a	Change the view to the previous interface on the stack unit, or if in line stack unit mode, the previous stack unit in the chassis.
T	Increase the screen refresh rate.
t	Decrease the screen refresh rate.

Key	Description
q	Return to the CLI prompt.

Example (Single Interface)

```
systest-3 Monitor time: 00:00:06 Refresh Intvl.: 2s Time:
03:26:26

Interface: tengig 0/3, Enabled, Link is Up, Linespeed is 1000
Mbit

Traffic statistics:    Current    Rate     Delta
       Input bytes:    9069828  43 Bps     86
      Output bytes:  606915800  43 Bps     86
     Input packets:      54001   0 pps      1
    Output packets:    9401589   0 pps      1
       64B packets:         67   0 pps      0
  Over 64B packets:      49166   0 pps      1
 Over 127B packets:        350   0 pps      0
 Over 255B packets:       1351   0 pps      0
 Over 511B packets:        286   0 pps      0
Over 1023B packets:       2781   0 pps      0
  Error statistics:
   Input underruns:          0   0 pps      0
      Input giants:          0   0 pps      0
   Input throttles:          0   0 pps      0
         Input CRC:          0   0 pps      0
 Input IP checksum:          0   0 pps      0
     Input overrun:          0   0 pps      0
  Output underruns:          0   0 pps      0
  Output throttles:          0   0 pps      0

  m - Change mode                c - Clear screen
  l - Page up                    a - Page down
  T - Increase refresh interval  t - Decrease refresh interval
  q - Quit
```

Example (All Interfaces)

```
systest-3 Monitor time: 00:01:31 Refresh Intvl.: 2s Time:
03:54:14

Interface  Link   In Packets   [delta] Out Packets
[delta]
   Gi 0/0  Down            0       0        0           0
   Gi 0/1  Down            0       0        0           0
   Gi 0/2  Up          61512      52    66160          42
   Gi 0/3  Up          63086      20   9405888         24
   Gi 0/4  Up    14697471418 2661481  13392989657
2661385
   Gi 0/5  Up           3759       3  161959604     832816
   Gi 0/6  Up           4070       3    8680346          5
   Gi 0/7  Up          61934      34  138734357         72
   Gi 0/8  Up          61427       1      59960          1
   Gi 0/9  Up          62039      53  104239232          3
   Gi 0/10 Up    17740044091     372  7373849244        79
   Gi 0/11 Up    18182889225      44  7184747584       138
   Gi 0/12 Up    18182682056       0        3682         1
   Gi 0/13 Up    18182681434      43  6592378911       144
   Gi 0/14 Up          61349      55    86281941        15
   Gi 0/15 Up          59808      58       62060        27
   Gi 0/16 Up          59889       1       61616         1
   Gi 0/17 Up              0       0    14950126     81293
   Gi 0/18 Up              0       0           0         0
   Gi 0/19 Down            0       0           0         0
```

```
   Gi 0/20 Up          62734      54       62766        18
   Gi 0/21 Up          60198       9      200899         9
   Gi 0/22 Up    17304741100 3157554 10102508511
1114221
   Gi 0/23 Up    17304769659 3139507 7133354895
523329
   m - Change mode        c - Clear screen
   b - Display bytes      r - Display pkts/bytes per sec
   l - Page up            a - Page down
```

name

Assign a name to the Default VLAN.

Syntax

`name`*`vlan-name`*

To remove the name from the VLAN, use the `no name` command.

Parameters

vlan-name	Enter up to 32 characters as the name of the VLAN.

Defaults

Not configured.

Command Modes

INTERFACE VLAN

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

This CLI applies only to the Default VLAN.

To display information about a named VLAN, enter the `show vlan` command with the name parameter or the `show interfaces description` command.

Related commands

default vlan-id—Assigns a descriptive text string to the interface.

interface vlan— Configures a VLAN.

show vlan— Displays the current VLAN configurations on the switch.

negotiation auto

Enable auto-negotiation on an interface.

Syntax

`negotiation auto`

To disable auto-negotiation, enter `no negotiation auto` command.

Defaults

Enabled.

Command Modes	INTERFACE
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator

Usage Information

The `no negotiation auto` command is only available if you first manually set the speed of a port to **10Mbits** or **100Mbits**.

The `negotiation auto` command provides a mode option for configuring an individual port to forced-master/forced slave once auto-negotiation is enabled.

If the mode option is not used, the default setting is slave. If you do not configure forced-master or forced slave on a port, the port negotiates to either a master or a slave state. Port status is one of the following:

- Forced-master
- Force-slave
- Master
- Slave
- Auto-neg Error—typically indicates that both ends of the node are configured with forced-master or forced-slave

CAUTION: Ensure that one end of your node is configured as forced-master and one is configured as forced-slave. If both are configured the same (that is forced-master or forced-slave), the show interfaces command will flap between an auto-neg-error and forced-master/slave states.

You can display master/slave settings with the `show interfaces` command.

Example (Master/Slave)

```
Dell(conf)# interface tengig 0/0
Dell(conf-if)#neg auto
Dell(conf-if-autoneg)# ?

end          Exit from configuration mode
exit         Exit from autoneg configuration mode
mode         Specify autoneg mode
no           Negate a command or set its defaults
show         Show autoneg configuration information
Dell(conf-if-autoneg)#mode ?
forced-master Force port to master mode
forced-slave  Force port to slave mode
Dell(conf-if-autoneg)#
```

Example (Configured)

```
Dell#show interfaces configured
TenGigabitEthernet 13/18 is up, line protocol is up
Hardware is Dell Eth, address is 00:01:e8:05:f7:fc
   Current address is 00:01:e8:05:f7:fc
Interface index is 474791997
Internet address is 1.1.1.1/24
MTU 1554 bytes, IP MTU 1500 bytes
LineSpeed 1000 Mbit, Mode full duplex, Master
ARP type: ARPA, ARP Timeout 04:00:00
Last clearing of "show interfaces" counters 00:12:42
Queueing strategy: fifo
```

```
Input Statistics:
...
```

User Information

Both sides of the link must have auto-negotiation enabled or disabled for the link to come up.

The following details the possible speed and auto-negotiation combinations for a line between two 10/100/1000 Base-T Ethernet interfaces.

Port 0

- auto-negotiation enabled* speed 1000 or auto
- auto-negotiation enabled speed 100
- auto-negotiation disabled speed 100
- auto-negotiation disabled speed 100
- auto-negotiation enabled* speed 1000 or auto

Port 1

- auto-negotiation enabled* speed 1000 or auto
- auto-negotiation enabled speed 100
- auto-negotiation disabled speed 100
- auto-negotiation enabled speed 100
- auto-negotiation disabled speed 100

Link Status Between Port 1 and Port 2

- Up at 1000 Mb/s
- Up at 100 Mb/s
- Up at 100 Mb/s
- Down
- Down

* You cannot disable auto-negotiation when the speed is set to 1000 or auto.

Related Commands

speed (for 1000/10000 interfaces) — sets the link speed to 1000, 10000, or auto-negotiate the speed.

source (port monitoring for 40-Gigabit Ethernet)

Configure a port monitor source and destination. Starting with Dell Networking OS Release 9.3(0.0), you can also configure a 40-Gigabit Ethernet interface as the destination interface or port to which the monitored traffic is sent .

Syntax

`source` *`interface`* `destination` *`interface`* `direction {rx | tx | both}`

To disable a monitor source, use the `no source` *`interface`* `destination` *`interface`* `direction {rx | tx | both}` command.

Parameters	*interface*	Enter the one of the following keywords and slot/port information: • For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` then the slot/port information. • For a 40-Gigabit Ethernet interface, enter the keyword `fortyGigE` then the slot/port information.
	destination	Enter the keyword `destination` to indicate the interface destination.
	direction {rx | tx | both}	Enter the keyword `direction` then one of the packet directional indicators. • `rx`: to monitor receiving packets only. • `tx`: to monitor transmitting packets only. • `both`: to monitor both transmitting and receiving packets.
Defaults	none	
Command Modes	MONITOR SESSION (conf-mon-*sess-session-ID*)	
Command History	**Version 9.3(0.0)**	Added support for the `fortyGigE` keyword on M I/O Aggregator
	Version 8.3.17.0	Supported on M I/O Aggregator

Example

```
Dell(conf-mon-sess-11)#source fortygi 10/0 destination gi
10/47 direction rx
Dell(conf-mon-sess-11)#
```

show config (INTERFACE mode)

Displays the interface configuration.

Syntax	`show config`	
Command Modes	INTERFACE	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

Example

```
Dell(conf-if)#show conf
!
interface TenGigabitEthernet 1/7
  no ip address
  switchport
```

```
  no shutdown
Dell(conf-if)#
```

show config (from INTERFACE RANGE mode)

Display the bulk configured interfaces (`group`).

Syntax

```
show config
```

Command Modes

CONFIGURATION INTERFACE (conf-if-range)

Command History

Version 8.3.17.0	Supported on the MI/O Aggregator.

Example

```
Dell(conf)#interface range tengigabitethernet 1/1 - 2
Dell(conf-if-range-tengig-1/1-2)#show config
!
interface TenGigabitEthernet 1/1
  no ip address
  switchport
  no shutdown
!
interface TenGigabitEthernet 1/2
  no ip address
  switchport
  no shutdown
Dell(conf-if-range-tengig-1/1-2)#
```

show config (from INTERFACE VLAN mode)

Displays the current configuration of the Default VLAN.

Syntax

```
show config
```

Command Modes

INTERFACE VLAN

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Example

```
Dell(conf-if-vl-1)#show config
!
interface Vlan 1
description a
no ip address
mtu 2500
shutdown
Dell(conf-if-vl-1)#
```

show config (from PROTOCOL LLDP mode)

Displays the LLDP configuration.

Syntax `show config`

Command Modes PROTOCOL LLDP

Example

```
Dell(conf-lldp)#show conf
!
protocol lldp
Dell(conf-lldp)#
```

show interfaces

Displays information on a specific physical interface or virtual interface.

Syntax `show interfaces` *interface*

Parameters

interface Enter one of the following keywords and slot/port or number information:

- For the management interface on the stack-unit, enter the keyword `managementethernet` followed by slot/port information. The slot and port range is 0.
- For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` then the slot/port information.
- For a VLAN interface, enter the keyword `vlan` followed by a number from 1 to 4094.
- For a Port Channel interface, enter the keyword `port-channel` followed by a number. The range is from 1 to 128.

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator

Usage Information

Use this `show interfaces` command for details on a specific interface. Use the `show interfaces stack-unit` command for details on all interfaces on the designated stack unit.

On the M I/O Aggregator, the show interface output displays incorrect rate information details over time for link monitoring when the rate-interval is configured for 5 seconds. Dell Networking recommends using higher rate-intervals such as 15 to 299 seconds to minimize the errors seen.

NOTE: In the CLI output, the power value will be rounded to a 3-digit value. For receive/transmit power that is less than 0.000, an snmp query will return the corresponding dbm value even though the CLI displays as 0.000.

NOTE: After the counters are cleared, the line-rate continues to increase until it reaches the maximum line rate. When the maximum line rate is reached, there will be no change in the line-rate.

User Information

The following describes the `show interfaces` command shown in the 10G example below.

Line	Description
TenGigabitEthernet 2/0...	Displays the interface's type, slot/port, and administrative and line protocol status.
Hardware is...	Displays the interface's hardware information and its assigned MAC address.
Interface index...	Displays the interface index number used by SNMP to identify the interface.
Internet address...	States whether an IP address is assigned to the interface. If an IP address is assigned, that address is displayed.
MTU 1554...	Displays link and IP MTU information. If the chassis is in Jumbo mode, this number can range from 576 to 12000.
LineSpeed	Displays the interface's line speed.
ARP type:...	Displays the ARP type and the ARP timeout value for the interface.
Last clearing...	Displays the time when the `show interfaces` counters where cleared.
Queuing strategy...	States the packet queuing strategy. FIFO means first in first out.
Input Statistics:	Displays all the input statistics including: • Number of packets and bytes into the interface • Number of packets with IP headers and VLAN tagged headers. NOTE: The sum of the number of packets may not be as expected since a VLAN tagged IP packet counts as both a VLAN packet and an IP packet. • Packet size and the number of those packets inbound to the interface • Number of symbol errors, runts, giants, and throttles packets: – symbol errors = number packets containing bad data. That is, the port MAC detected a physical coding error in the packet. – runts = number of packets that are less than 64B

Line	Description
	– giants = packets that are greater than the MTU size – throttles = packets containing PAUSE frames • Number of CRC, IP Checksum, overrun, and discarded packets: – CRC = packets with CRC/FCS errors – IP Checksum = packets with IP Checksum errors – overrun = number of packets discarded due to FIFO overrun conditions – discarded = the sum of runts, giants, CRC, IP Checksum, and overrun packets discarded without any processing
Output Statistics:	Displays output statistics sent out of the interface including: • Number of packets, bytes, and underruns out of the interface – packets = total number of packets – bytes = total number of bytes – underruns = number of packets with FIFO underrun conditions • Number of Multicast, Broadcast, and Unicast packets: – Multicasts = number of MAC multicast packets – Broadcasts = number of MAC broadcast packets – Unicasts = number of MAC unicast packets • Number of throttles and discards packets:: – throttles = packets containing PAUSE frames – discarded = number of packets discarded without any processing
Rate information...	Estimate of the input and output traffic rate over a designated interval (30 to 299 seconds). Traffic rate is displayed in bits, packets per second, and percent of line rate.
Time since...	Elapsed time since the last interface status change (hh:mm:ss format).

Usage Information

The interface counter "over 1023-byte pkts" does not increment for packets in the range 9216 > x <1023.

The Management port is enabled by default (`no shutdown`). If necessary, use the `ip address` command to assign an IP address to the Management port.

Example 10G Port

```
Dell#show interfaces tengigabitethernet 2/0
TenGigabitEthernet 2/0 is up, line protocol is up
Hardware is Dell Force10Eth, address is 00:01:e8:05:f7:3a
Interface index is 100990998
```

```
Internet address is 213.121.22.45/28
MTU 1554 bytes, IP MTU 1500 bytes
LineSpeed 10000 Mbit
ARP type: ARPA, ARP Timeout 04:00:00
Last clearing of "show interfaces" counters 02:31:45
Queueing strategy: fifo
Input Statistics:
0 packets, 0 bytes
Input 0 IP Packets, 0 Vlans 0 MPLS
0 64-byte pkts, 0 over 64-byte pkts, 0 over 127-byte pkts
0 over 255-byte pkts, 0 over 511-byte pkts, 0 over 1023-byte
pkts
0 symbol errors, 0 runts, 0 giants, 0 throttles
0 CRC, 0 IP Checksum, 0 overrun, 0 discarded
Output Statistics:
1 packets, 64 bytes, 0 underruns
0 Multicasts, 2 Broadcasts, 0 Unicasts
0 IP Packets, 0 Vlans, 0 MPLS
0 throttles, 0 discarded
Rate info (interval 299 seconds):
Input 00.00 Mbits/sec, 0 packets/sec, 0.00% of line-rate
Output 00.00 Mbits/sec, 0 packets/sec, 0.00% of line-rate
Time since last interface status change: 00:00:27
```

Example (ManagementEthernet)

```
Dell#show interface managementethernet ?
0/0 Management Ethernet interface number
Dell#show interface managementethernet 0/0
ManagementEthernet 0/0 is up, line protocol is up
Hardware is DellForce10Eth, address is 00:1e:c9:f1:00:05
Current address is 00:1e:c9:f1:00:05
Pluggable media not present
Interface index is 235159752
Internet address is 10.11.209.87/16
Mode of IP Address Assignment : MANUAL
DHCP Client-ID: mgmt001ec9f10005
Virtual-IP is not set
Virtual-IP IPv6 address is not set
MTU 1554 bytes, IP MTU 1500 bytes
LineSpeed 100 Mbit, Mode full duplex
ARP type: ARPA, ARP Timeout 04:00:00
Last clearing of "show interface" counters 5d4h57m
Queueing strategy: fifo
Input 3448753 packets, 950008323 bytes, 3442163 multicast
Received 0 errors, 0 discarded
Output 4627 packets, 814226 bytes, 0 multicast
Output 0 errors, 0 invalid protocol
```

Related Commands

show interfaces configured—Displays any interface with a non-default configuration.

show interfaces port-channel— Displays information on all interfaces on a specific stack unit.

show interfaces switchport—Displays Layer 2 information about the interfaces.

show inventory— Displays the M I/O Aggregator type, components (including media), Dell Networking OS version including hardware identification numbers and configured protocols.

show ip interface— Displays Layer 3 information about the interfaces.

show memory— Displays the stack unit(s) status.

show interfaces status— Displays all interfaces configured using the interface range command.

show interfaces configured

Displays any interface with a non-default configuration.

Syntax	`show interfaces configured`
Command Modes	• EXEC • EXEC Privilege
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator

Example (ManagementEthernet)	`Dell#show interfaces configured`
	`TenGigabitEthernet 1/1 is up, line protocol is down(error-disabled[UFD])`
	`Hardware is DellForce10Eth, address is 00:01:e8:00:ab:01`
	`Current address is 00:01:e8:00:ab:01`
	`Server Port AdminState is Down`
	`Pluggable media not present`
	`Interface index is 67703553`
	`Internet address is not set`
	`Mode of IP Address Assignment : NONE`
	`DHCP Client-ID :tenG2580001e800ab01`
	`MTU 12000 bytes, IP MTU 11982 bytes`
	`LineSpeed auto`
	`Flowcontrol rx off tx off`
	`ARP type: ARPA, ARP Timeout 04:00:00`
	`Last clearing of "show interface" counters 05:15:07`
	`Queueing strategy: fifo`
	`Input Statistics:`
	`0 packets, 0 bytes`
	`0 64-byte pkts, 0 over 64-byte pkts, 0 over 127-byte pkts`
	`0 over 255-byte pkts, 0 over 511-byte pkts, 0 over 1023-byte pkts`
	`0 Multicasts, 0 Broadcasts`
	`0 runts, 0 giants, 0 throttles`
	`0 CRC, 0 overrun, 0 discarded`
	`Output Statistics:`
	`0 packets, 0 bytes, 0 underruns`
	`0 64-byte pkts, 0 over 64-byte pkts, 0 over 127-byte pkts`
	`0 over 255-byte pkts, 0 over 511-byte pkts, 0 over 1023-byte pkts`
	`0 Multicasts, 0 Broadcasts, 0 Unicasts`
	`0 throttles, 0 discarded, 0 collisions, 0 wreddrops`
	`Rate info (interval 299 seconds):`
	`Input 00.00 Mbits/sec, 0 packets/sec, 0.00% of line-rate`
	`Output 00.00 Mbits/sec, 0 packets/sec, 0.00% of line-rate`
	`Time since last interface status change: 05:14:12`

```
TenGigabitEthernet 1/2 is up, line protocol is down(error-
disabled[UFD])
Dell#
```

show interfaces description

Display the descriptions configured on the interface.

Syntax `show interfaces [interface] description`

Parameters

interface — Enter one of the following keywords and slot/port or number information:

- For the management interface on the stack unit enter the keyword `ManagementEthernet` followed by the slot/port information. The slot range is 0-0 and the port range is 0.
- For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information.
- For VLAN interfaces, enter the keyword `vlan` followed by a number from 1 to 4094.

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator

Usage Information

The following describes the `show interfaces description` command shown in the Example below.

Field	Description
Interface	Displays the type of interface and associated slot and port number.
OK?	Indicates if the hardware is functioning properly.
Status	States whether the interface is enabled (up) or disabled (administratively down).
Protocol	States whether IP is enabled (up) or disabled (down) on the interface.
Description	Displays the description (if any) manually configured for the interface.

Example

```
Dell#show interface description
Interface              OK  Status      Protocol    Description
TenGigabitEthernet 0/1 NO  admin down  down
```

```
TenGigabitEthernet 0/2 NO admin up     down
TenGigabitEthernet 0/3 NO admin up     down
TenGigabitEthernet 0/4 NO admin up     down
TenGigabitEthernet 0/5 NO admin up     down
TenGigabitEthernet 0/6 NO admin up     down
TenGigabitEthernet 0/7 NO up down
TenGigabitEthernet 0/8 YES up up
TenGigabitEthernet 0/9 NO admin down   down
TenGigabitEthernet 0/10 NO admin down  down
TenGigabitEthernet 0/11 NO admin down  down
TenGigabitEthernet 0/12 NO admin down  down
TenGigabitEthernet 0/13 NO admin down  down
TenGigabitEthernet 0/14 NO admin down  down
TenGigabitEthernet 0/15 NO admin down  down
TenGigabitEthernet 0/16 YES up up
TenGigabitEthernet 0/17 NO admin down  down
TenGigabitEthernet 0/18 NO admin down  down
TenGigabitEthernet 0/19 NO admin down  down
TenGigabitEthernet 0/20 NO admin down  down
TenGigabitEthernet 0/21 NO admin down  down
```

show interfaces port-channel

Display information on configured Port Channel groups.

Syntax

```
show interfaces port-channel [channel-number] [brief| description]
```

Parameters

channel-number	For a Port Channel interface, enter the keyword `port-channel` followed by a number. The range is from 1 to 128.
brief	(OPTIONAL) Enter the keyword `brief` to display only the port channel number, the state of the port channel, and the number of interfaces in the port channel.
description	(OPTIONAL) Enter the keyword description to display interface information with description.

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

The following describes the `show interfaces port-channel` command shown in the following example.

Field	Description
Port-Channel 1...	Displays the LAG's status. In the Example, the status of the LAG's LAG fate-sharing group ("Failover-group") is listed.

Field	Description
Hardware is...	Displays the interface's hardware information and its assigned MAC address.
Port-channel is part...	Indicates whether the LAG is part of a LAG fate-sharing group ("Failover-group").
Internet address...	States whether an IP address is assigned to the interface. If an IP address is assigned, that address is displayed.
MTU 1554...	Displays link and IP MTU.
LineSpeed	Displays the interface's line speed. For a port channel interface, it is the line speed of the interfaces in the port channel.
Members in this...	Displays the interfaces belonging to this port channel.
ARP type:...	Displays the ARP type and the ARP timeout value for the interface.
Last clearing...	Displays the time when the `show interfaces` counters were cleared.
Queueing strategy.	States the packet queuing strategy. FIFO means first in first out.
packets input...	Displays the number of packets and bytes into the interface.
Input 0 IP packets...	Displays the number of packets with IP headers, VLAN tagged headers, and MPLS headers. The number of packets may not add correctly because a VLAN tagged IP packet counts as both a VLAN packet and an IP packet.
0 64-byte...	Displays the size of packets and the number of those packets entering that interface. This information is displayed over two lines.
Received 0...	Displays the type and number of errors or other specific packets received. This information is displayed over three lines.
Output 0...	Displays the type and number of packets sent out the interface. This information is displayed over three lines.
Rate information...	Displays the traffic rate information into and out of the interface. Traffic rate is displayed in bits and packets per second.
Time since...	Displays the time since the last change in the configuration of this interface.

Example (EtherScale)

```
Dell#show interfaces port-channel
Port-channel 1 is down, line protocol is down
Hardware address is 00:1e:c9:f1:00:05, Current address is
00:1e:c9:f1:00:05
Interface index is 1107755009
Minimum number of links to bring Port-channel up is 1
Internet address is not set
```

```
Mode of IP Address Assignment : NONE
DHCP Client-ID :lag1001ec9f10005
MTU 12000 bytes, IP MTU 1500 bytes
LineSpeed auto
Members in this channel:
ARP type: ARPA, ARP Timeout 04:00:00
Last clearing of "show interface" counters 03:28:00
Queueing strategy: fifo
Input Statistics:
0 packets, 0 bytes
0 64-byte pkts, 0 over 64-byte pkts, 0 over 127-byte pkts
0 over 255-byte pkts, 0 over 511-byte pkts, 0 over 1023-byte
pkts
0 Multicasts, 0 Broadcasts
0 runts, 0 giants, 0 throttles
0 CRC, 0 overrun, 0 discarded
Output Statistics:
0 packets, 0 bytes, 0 underruns
0 64-byte pkts, 0 over 64-byte pkts, 0 over 127-byte pkts
0 over 255-byte pkts, 0 over 511-byte pkts, 0 over 1023-byte
pkts
0 Multicasts, 0 Broadcasts, 0 Unicasts
0 throttles, 0 discarded, 0 collisions
```

User Information

The following describes the `show interfaces port-channel brief` command shown in the following example.

Field	Description
LAG	Lists the port channel number.
Mode	Lists the mode: • L3 — for Layer 3 • L2 — for Layer 2
Status	Displays the status of the port channel. • down — if the port channel is disabled (`shutdown`) • up — if the port channel is enabled (`no shutdown`)
Uptime	Displays the age of the port channel in hours:minutes:seconds.
Ports	Lists the interfaces assigned to this port channel.
(untitled)	Displays the status of the physical interfaces (up or down). • In Layer 2 port channels, an * (asterisk) indicates which interface is the primary port of the port channel. The primary port sends out interface PDU. • In Layer 3 port channels, the primary port is not indicated.

Example

```
Dell#show int po 1 brief
Codes: L - LACP Port-channel
LAG Mode Status Uptime Ports
```

```
1 L2 down 00:00:00 Te 0/16 (Down)
Dell#
```

Related Commands show lacp — displays the LACP matrix.

show interfaces stack-unit

Display information on all interfaces on a specific M I/O Aggregator stack member.

Syntax `show interfaces stack-unit unit-number`

Parameters

unit-number	Enter the stack member number (0 to 5).

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Example

```
Dell#show interfaces stack-unit 0
TenGigabitEthernet 0/1 is down, line protocol is down
Hardware is DellForce10Eth, address is 00:1e:c9:f1:00:05
Current address is 00:1e:c9:f1:00:05
Server Port AdminState is Down
Pluggable media not present
Interface index is 34148609
Internet address is not set
Mode of IP Address Assignment : NONE
DHCP Client-ID :tenG130001ec9f10005
MTU 1554 bytes, IP MTU 1500 bytes
LineSpeed auto
Flowcontrol rx off tx off
ARP type: ARPA, ARP Timeout 04:00:00
Last clearing of "show interface" counters 5d5h24m
Queueing strategy: fifo
Input Statistics:
0 packets, 0 bytes
0 64-byte pkts, 0 over 64-byte pkts, 0 over 127-byte pkts
0 over 255-byte pkts, 0 over 511-byte pkts, 0 over 1023-byte
pkts
0 Multicasts, 0 Broadcasts
0 runts, 0 giants, 0 throttles
0 CRC, 0 overrun, 0 discarded
Output Statistics:
0 packets, 0 bytes, 0 underruns
0 64-byte pkts, 0 over 64-byte pkts, 0 over 127-byte pkts
0 over 255-byte pkts, 0 over 511-byte pkts, 0 over 1023-byte
pkts
0 Multicasts, 0 Broadcasts, 0 Unicasts
0 throttles, 0 discarded, 0 collisions
Rate info (interval 299 seconds):
Input 00.00 Mbits/sec, 0 packets/sec, 0.00% of line-rate
Output 00.00 Mbits/sec, 0 packets/sec, 0.00% of line-rate
```

```
Time since last interface status change: 5d5h23m
!-------------output truncated ----------------!
```

Related Commands

show diag— Displays data plane and management plane input/output statistics.

show interfaces status

Displays a summary of interface information or specify a stack unit and interface to display status information for that specific interface only.

Syntax

```
show interfaces [interface | stack-unit unit-number] status
```

Parameters

interface	(OPTIONAL) Enter one of the following keywords and slot/port or number information: • For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information.
linecard *slot-number*	(OPTIONAL) Enter the keyword `linecard` then the slot number.

Defaults

none

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator

Example

```
Dell#show interface status
Port    Description    Status   Speed    Duplex   Vlan
Te 0/1                  Down     Auto     Auto     --
Te 0/2                  Down     Auto     Auto     --
Te 0/3                  Down     Auto     Auto     --
Te 0/4                  Down     Auto     Auto     --
Te 0/5                  Down     Auto     Auto     --
Te 0/6                  Down     Auto     Auto     --
Te 0/7                  Down     Auto     Auto     --
Te 0/8                  Up 1   0000 Mbit  Full     --
Te 0/9                 Down     Auto      Auto     --
Te 0/10                Down     Auto      Auto     --
Te 0/11                Down     Auto      Auto     --
Te 0/12                Down     Auto      Auto     --
Te 0/13                Down     Auto      Auto     --
Te 0/14                Down     Auto      Auto     --
Te 0/15                Down     Auto       Auto    --
Te 0/16                 Up      10000 Mbit Full    --
```

show interfaces switchport

Display only virtual and physical interfaces in Layer 2 mode. This command displays the Layer 2 mode interfaces' IEEE 802.1Q tag status and VLAN membership.

Syntax

```
show interfaces switchport [interface | stack-unit unit-id ]
```

Parameters

interface	(OPTIONAL) Enter one of the following keywords and slot/port or number information: • For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information. • Enter the keyword `backup` to view the backup interface for this interface.
stack-unit *unit-id*	(OPTIONAL) Enter the keywords `stack-unit` followed by the stack member number. The range is from 0 to 5.

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

The following describes the `show interfaces switchport` command for the following example.

Items	Description
Name	Displays the interface's type, slot, and port number.
802.1QTagged	Displays whether if the VLAN tagged ("True"), untagged ("False"), or hybrid ("Hybrid"), which supports both untagged and tagged VLANs by port 13/0.
Vlan membership	Lists the VLANs to which the interface is a member. Starting with Dell Networking OS version 7.6.1, this field can display native VLAN membership by port 13/0.

Example

```
Dell#show interfaces switchport
Codes: U - Untagged, T - Tagged
x - Dot1x untagged, X - Dot1x tagged
G - GVRP tagged, M - Trunk, H - VSN tagged
i - Internal untagged, I - Internal tagged, v - VLT untagged,
V - VLT
tagged
Name: TenGigabitEthernet 1/1
802.1QTagged: Hybrid
IO-AGG port mode: Auto VLANs enabled
Vlan membership:
Q Vlans
U 1
T 2-4094
Native VlanId: 1.
```

```
Name: TenGigabitEthernet 1/2
802.1QTagged: Hybrid
IO-AGG port mode: Auto VLANs enabled
Vlan membership:
Q Vlans
U 1
T 2-4094
Native VlanId: 1.
--More--
```

Related Commands show ip interface— displays Layer 3 information about the interfaces.

show range

Display all interfaces configured using the `group` command.

Syntax `show range`

Command Modes INTERFACE RANGE (config-if-range)

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator

Example

```
Dell(conf-if-range-te-0/16)#show range
interface tengigabitethernet 0/16
Dell(conf-if-range-te-0/16)#
```

Related Commands show ip interface— displays Layer 3 information about the interfaces.

show tdr

Displays the TDR test results.

Syntax `show tdr` *interface*

Parameters

interface	Enter the keyword `TenGigabitEthernet` followed by the slot/port information for the 100/1000/10 GbaseT Ethernet interface.

Defaults none

Command Modes EXEC

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

If the TDR test has not been run, an error message is generated:

```
%Error: Please run the TDR test first
```

The following describes the TDR test status.

Status	Definition
OK Status: Terminated	TDR test is complete, no fault is detected on the cable, and the test is terminated.
Length: 92 (+/- 1) meters, Status: Shorted	A short is detected on the cable. The location, in this Example is 92 meters. The short is accurate to plus or minus one meter.
Length: 93 (+/- 1) meters, Status: Open	An opening is detected on the cable. The location, in this Example is 93 meters. The open is accurate to plus or minus one meter.
Status: Impedance Mismatch	There is an impedance mismatch in the cables.

Example

```
Dell#show tdr tengigabitethernet 1/1
Time since last test: 00:00:02
Pair A, Length: OK Status: Terminated
Pair B, Length: 92 (+/- 1) meters, Status: Short
Pair C, Length: 93 (+/- 1) meters, Status: Open
Pair D, Length: 0 (+/- 1) meters, Status: Impedance Mismatch
```

Related Commands

vlan tagged— Runs the TDR test.

show vlan

Displays the current VLAN configurations on the switch.

Syntax

```
show vlan [brief |id vlan-id | name vlan-name]
```

Parameters

brief	(OPTIONAL) Enter the keyword `brief` to display the following information: • VLAN ID • VLAN name (left blank if none is configured.) • Spanning Tree Group ID • MAC address aging time • IP address
id *vlan-id*	(OPTIONAL) Enter the keyword `id` followed by a number from 1 to 4094. Only information on the VLAN specified is displayed

name *vlan-name*	(OPTIONAL) Enter the keyword name followed by the name configured for the VLAN. Only information on the VLAN named is displayed.

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

The following describes the `show vlan` command information given in the following example

Column Heading	Description
(Column 1 — no heading)	• asterisk symbol (*) = Default VLAN • G = GVRP VLAN • P = primary VLAN • C = community VLAN • I = isolated VLAN
NUM	Displays existing VLAN IDs.
Status	Displays the word Inactive for inactive VLANs and the word Active for active VLANs.
Q	Displays G for GVRP tagged, M for member of a VLAN-Stack VLAN, T for tagged interface, U (for untagged interface), x (uncapitalized x) for Dot1x untagged, or X (capitalized X) for Dot1x tagged.
Ports	Displays the type, slot, and port information. For the type, Po = port channel, Fo= fortygigabit ethernet, and Te = ten gigabit ethernet.

Example

```
Dell# show vlan id 40
Codes: * - Default VLAN, G - GVRP VLANs, R - Remote Port
Mirroring
VLANs, P - Primary, C - Community, I - Isolated
Q: U - Untagged, T - Tagged
x - Dot1x untagged, X - Dot1x tagged
G - GVRP tagged, M - Vlan-stack, H - VSN tagged
i - Internal untagged, I - Internal tagged, v - VLT untagged, V
- VLT tagged
NUM Status Description Q Ports
1 Inactive a
Dell#
```

Example (Brief)

```
Dell#show vlan brief
VLAN Name                              STG MAC Aging   IP
Address
---- --------------------------------- ---- ---------
------------------
1                                       0      0
```

```
unassigned
2                                       0       0
unassigned
20                                      0       0
unassigned
1002                                    0       0
unassigned
Dell#
```

Example (Using a VLAN Name)

```
Dellconf)#interface vlan 222
Dell(conf-if-vl-222)#name test
Dell(conf-if-vl-222)#do show vlan name test
Codes: * - Default VLAN, G - GVRP VLANs
Q: U - Untagged, T - Tagged
x - Dot1x untagged, X - Dot1x tagged
G - GVRP tagged, M - Vlan-stack
NUM Status Description Q Ports
222 Inactive U TenGig 1/22
Dell(conf-if-vl-222)#
Dell#
```

Related Commands

interface vlan— Configures a VLAN.

shutdown

Disable an interface.

Syntax

`shutdown`

To activate an interface, use the `no shutdown` command.

Defaults

The interface is disabled.

Command Modes

INTERFACE

Command History

Version 8.3.17.0 Supported on the M I/O Aggregator.

Usage Information

The `show tdr` command marks a physical interface as unavailable for traffic. To discover if an interface is disabled, use the `show ip interface` command. Disabled interfaces are listed as down.

Disabling a VLAN or a port channel causes different behavior. When a VLAN is disabled, the Layer 3 functions within that VLAN are disabled. Layer 2 traffic continues to flow. Entering the `show tdr` command on a port channel disables all traffic on the port channel and the individual interfaces within the port channel. To enable a port channel, you must enter `no show tdr` on the port channel interface and at least one interface within that port channel.

The `show tdr` and `description` commands are the only commands that you can configure on an interface that is a member of a port channel.

Related Commands

vlan tagged—Test the condition of copper cables on 100/1000/10G Base-T modules.

interface vlan— Creates a VLAN.

show ip interface— Displays the interface routing status. Add the keyword `brief` to display a table of interfaces and their status.

speed (for 1000/10000 interfaces)

Set the speed for 1000/10000 Base-T Ethernet interfaces. Both sides of a link must be set to the same speed (1000/10000) or to auto or the link may not come up.

Syntax

`speed {1000 | 10000 | auto}`

To return to the default setting, use the `no speed {1000 | 10000 |auto}` command.

Parameters

1000	Enter the keyword `1000` to set the interface's speed to 1000 Mb/s.
10000	Enter the keyword `10000` to set the interface's speed to 10000 Mb/s. Auto-negotiation is enabled. For more information, refer to `name`
auto	Enter the keyword `auto` to set the interface to auto-negotiate its speed. Auto-negotiation is enabled. For more information, refer to `name`.

Defaults

auto

Command Modes

INTERFACE

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

This command is found on the 1000/10000 Base-T Ethernet interfaces.

When you enable `auto`, the system performs and automatic discovery to determine the optics installed and configure the appropriate speed.

When you configure a speed for the 1000/10000 interface, confirm the `negotiation auto` command setting. Both sides of the link must should have auto-negotiation either enabled or disabled. For speed settings of 1000 or auto, the software sets the link to auto-negotiation and you cannot change that setting.

Related Commands	negotiation auto — enables or disables auto-negotiation on an interface.

tdr-cable-test

Test the condition of copper cables on 100/1000/10GBase-T modules.

Syntax

```
tdr-cable-test interface
```

Parameters

interface	Enter the keyword `TenGigabitEthernet` followed by the slot/port information for the 100/1000/10GBase-T Ethernet interface.

Defaults none

Command Modes EXEC

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information The interface must be enabled to run the test or an error message is generated:

```
Dell#tdr-cable-test tengigabitethernet 5/2

%Error: Interface is disabled TenGIG 5/2
```

Related Commands show tdr— Displays the results of the TDR test.

vlan tagged (CMC)

Add a Layer 2 interface to a VLAN as a tagged interface.

Syntax

```
tagged interface
```

To remove a tagged interface from a VLAN, use the `no tagged interface` command.

Parameters

interface	Enter the following keywords and slot/port or number information: • For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information.

Defaults	**All interfaces in Layer 2 mode are untagged.**
Command Modes	INTERFACE
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.
Usage Information	When you use the `no tagged` command, the interface is automatically placed in the default VLAN as an untagged interface unless the interface is a member of another VLAN. If the interface belongs to several VLANs, you must remove it from all VLANs to change it to an untagged interface. Tagged interfaces can belong to multiple VLANs, while untagged interfaces can only belong to one VLAN at a time. When two or more ports configured for VLANs form a LAG, the resulting LAG is a tagged member of all the configured VLANs and an untagged member of the VLAN to which the port with the lowest port ID belongs. For example, if port 0/1-32 is an untagged member of VLAN 2 and port 0/41 is an untagged member of VLAN 3, the resulting LAG consisting of the two ports is an untagged member of VLAN 2 and a tagged member of VLAN3.

Example	`Dell(conf-if-te-0/2)#vlan tagged ?`
	`VLAN-RANGE  Comma/Hyphen separated VLAN ID set`
	`Dell(conf-if-te-0/2)#vlan tagged 2,3-4`
	`Dell(conf-if-te-0/2)#show config`
	`!`
	`interface TenGigabitEthernet 0/2`
	`mtu 12000`
	`vlan tagged 2-4`
	`!`
	`port-channel-protocol LACP`
	`port-channel 1 mode active`
	`!`
	`protocol lldp`
	`advertise management-tlv system-name`
	`dcbx port-role auto-downstream`
	`no shutdown`
	`Dell(conf-if-te-0/2)#`

Related Commands	interface vlan —Configures a VLAN. vlan untagged — Specifies which interfaces in a VLAN are untagged.

vlan untagged (CMC)

Add a Layer 2 interface to a VLAN as an untagged interface.

Syntax `untagged` *`interface`*

To remove a untagged interface from a VLAN, use the `no untagged interface` command.

Parameters

interface	Enter the following keywords and slot/port or number information: • For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information

Defaults All interfaces in Layer 2 mode are untagged.

Command Modes INTERFACE VLAN

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

Untagged interfaces can only belong to one VLAN.

In the default VLAN, you cannot use the `no untagged interface` command. To remove an untagged interface from all VLANs, including the default VLAN, enter INTERFACE mode and use the `no vlan tagged` command.

Tagged interfaces can belong to multiple VLANs, while untagged interfaces can only belong to one VLAN at a time.

When two or more ports configured for VLANs form a LAG, the resulting LAG is a tagged member of all the configured VLANs and an untagged member of the VLAN to which the port with the lowest port ID belongs.

For example, if port 0/33 is an untagged member of VLAN 2 and port 0/41 is an untagged member of VLAN 3, the resulting LAG consisting of the two ports is an untagged member of VLAN 2 and a tagged member of VLANs 2 and 3.

Example

```
Dell(conf-if-te-0/2)#vlan untagged ?
<1-4094> Untagged VLAN id
Dell(conf-if-te-0/2)#
Dell(conf-if-te-0/2)#vlan untagged 4094
Dell(conf-if-te-0/2)#show config
!
interface TenGigabitEthernet 0/2
mtu 12000
vlan untagged 4094
!
port-channel-protocol LACP
port-channel 1 mode active
!
protocol lldp
advertise management-tlv system-name
dcbx port-role auto-downstream
no shutdown
Dell(conf-if-te-0/2)#
```

Related Commands

interface vlan —Configures a VLAN.

vlan tagged — Specifies which interfaces in a VLAN are tagged.

12

IPv4 Routing

IP Commands

This chapter describes the IPv4-related commands. They are:

- clear tcp statistics
- debug ip dhcp
- debug ip icmp
- ip route
- management route
- show arp
- show ip management-route
- show ip multicast-cam stack-unit
- show ip interface
- show ip route
- show ip management-route

clear tcp statistics

Clear the TCP counters.

Syntax	`clear tcp statistics`	
Command Modes	EXEC Privilege	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

debug ip dhcp

Enable debug information for dynamic host configuration protocol (DHCP) relay transactions and display the information on the console.

Syntax	`debug ip dhcp` To disable debug, use the `no debug ip dhcp` command.
Defaults	Debug disabled

Command Modes	EXEC Privilege
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.

Example

```
Dell#debug ip dhcp
00:12:21 : %RELAY-I-PACKET: BOOTP REQUEST (Unicast) received
at interface 113.3.3.17 BOOTP
Request, hops = 0, XID = 0xbf05140f, secs = 0, hwaddr =
00:60:CF:20:7B:8C, giaddr = 0.0.0.0
00:12:21 : %RELAY-I-BOOTREQUEST: Forwarded BOOTREQUEST for
00:60:CF:20:7B:8C to 14.4.4.2
00:12:26 : %RELAY-I-PACKET: BOOTP REQUEST (Unicast) received
at interface 113.3.3.17 BOOTP
Request, hops = 0, XID = 0xbf05140f, secs = 5, hwaddr =
00:60:CF:20:7B:8C, giaddr = 0.0.0.0
00:12:26 : %RELAY-I-BOOTREQUEST: Forwarded BOOTREQUEST for
00:60:CF:20:7B:8C to 14.4.4.2
00:12:40 : %RELAY-I-PACKET: BOOTP REQUEST (Unicast) received
at interface 113.3.3.17 BOOTP
Request, hops = 0, XID = 0xda4f9503, secs = 0, hwaddr =
00:60:CF:20:7B:8C, giaddr = 0.0.0.0
00:12:40 : %RELAY-I-BOOTREQUEST: Forwarded BOOTREQUEST for
00:60:CF:20:7B:8C to 14.4.4.2
00:12:42 : %RELAY-I-PACKET: BOOTP REPLY (Unicast) received at
interface 14.4.4.1 BOOTP Reply,
hops = 0, XID = 0xda4f9503, secs = 0, hwaddr = 00:60:CF:20:7B:
8C, giaddr = 113.3.3.17
00:12:42 : %RELAY-I-BOOTREPLY: Forwarded BOOTREPLY for
00:60:CF:20:7B:8C to 113.3.3.254
00:12:42 : %RELAY-I-PACKET: BOOTP REQUEST (Unicast) received
at interface 113.3.3.17 BOOTP
Request, hops = 0, XID = 0xda4f9503, secs = 0, hwaddr =
00:60:CF:20:7B:8C, giaddr = 0.0.0.0
00:12:42 : %RELAY-I-BOOTREQUEST: Forwarded BOOTREQUEST for
00:60:CF:20:7B:8C to 14.4.4.2
00:12:42 : %RELAY-I-PACKET: BOOTP REPLY (Unicast) received at
interface 14.4.4.1 BOOTP Reply,
hops = 0, XID = 0xda4f9503, secs = 0, hwaddr = 00:60:CF:20:7B:
8C, giaddr = 113.3.3.17
00:12:42 : %RELAY-I-BOOTREPLY: Forwarded BOOTREPLY for
00:60:CF:20:7B:8C to 113.3.3.254
Dell#
```

debug ip icmp

View information on the internal control message protocol (ICMP).

Syntax `debug ip icmp [interface] [count value]`

To disable debugging, use the `no debug ip icmp` command.

Parameters

interface	(OPTIONAL) Enter the following keywords and slot/port or number information:

- For the Management interface, enter the keyword `ManagementEthernet` followed by the slot/port information. The slot range is 0 and the port range is 0.
- For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information.
- For a VLAN, enter the keyword `vlan` followed by a number from 1 to 4094.

count *value* (OPTIONAL) Enter the keyword `count` followed by the count value. The range is from 1 to 65534. The default is **Infinity**.

Command Modes EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Example

```
ICMP: echo request rcvd from src 40.40.40.40
ICMP: src 40.40.40.40, dst 40.40.40.40, echo reply
ICMP: src 40.40.40.40, dst 40.40.40.40, echo reply
ICMP: echo request sent to dst 40.40.40.40
ICMP: echo request rcvd from src 40.40.40.40
ICMP: src 40.40.40.40, dst 40.40.40.40, echo reply
ICMP: src 40.40.40.40, dst 40.40.40.40, echo reply
ICMP: echo request sent to dst 40.40.40.40
```

Usage Information Use the `count` option to stop packets from flooding the user terminal when debugging is turned on.

ip route

Assign a static route to the switch.

Syntax

`ip route` *`destination mask`* {*`ip-address`* | *`interface [ip-address]`*} *`[distance]`* [permanent][tag *`tag-value`*]

To delete a specific static route, use the `no ip route` *`destination mask {address | interface [ip-address]}`* command.

To delete all routes matching a certain route, use the `no ip route` *`destination mask`* command.

Parameters

destination	Enter the IP address in dotted decimal format of the destination device.
mask	Enter the mask in the slash prefix format (/x) of the destination device's IP address.
ip-address	Enter the IP address in dotted decimal format of the forwarding router.

	interface	Enter the following keywords and slot/port or number information: • For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information. • For a VLAN, enter the keyword `vlan` followed by a number from 1 to 4094.
	distance	(OPTIONAL) Enter a number as the distance metric assigned to the route. The range is from 1 to 255.
	permanent	(OPTIONAL) Enter the keyword `permanent` to specify the route is not removed, even if the interface assigned to that route goes down. The route must be up initially to install it in the routing table. If you disable the interface with an IP address associated with the keyword `permanent`, the route disappears from the routing table.
	tag *tag-value*	(OPTIONAL) Enter the keyword `tag` followed by a number to assign to the route. The range is from 1 to 4294967295.

Defaults Not configured.

Command Modes CONFIGURATION

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information Using the following example of a static route: ip route 33.33.33.0 /24 tengigabitethernet 0/0 172.31.5.43

- The software installs a next hop that is not on the directly connected subnet but which recursively resolves to a next hop on the interface's configured subnet. In the example, if gig 0/0 has an ip address on subnet 2.2.2.0 and if 172.31.5.43 recursively resolves to 2.2.2.0, Dell Networking OS installs the static route.
- When the interface goes down, Dell Networking OS withdraws the route.
- When the interface comes up, Dell Networking OS re-installs the route.
- When recursive resolution is "broken," Dell Networking OS withdraws the route.
- When recursive resolution is satisfied, Dell Networking OS re-installs the route.

Related Commands show ip route— views the switch routing table.

management route

Configure a static route that points to the Management interface or a forwarding router.

Syntax

```
management route {ipv4-address}/mask{forwarding-router-address
| managementethernet}
```

Parameters

{ipv4-address}/mask	Enter an IPv4 address (A.B.C.D) followed by the prefix-length for the IP address of the management interface.
forwarding-router-address	Enter an IPv4 address of a forwarding router.
managementethernet	Enter the keyword `managementethernet` for the Management interface.

Defaults Not configured.

Command Modes CONFIGURATION

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information When a static route (or a protocol route) overlaps with Management static route, the static route (or a protocol route) is preferred over the Management Static route. Also, Management static routes and the Management Connected prefix are not reflected in the hardware routing tables. Separate routing tables are maintained for IPv4 management routes. This command manages both tables.

show arp

Displays the ARP table.

Syntax

```
show arp [interface interface | ip ip-address [mask] |
macaddress mac-address [mac-address mask]] [static | dynamic]
[summary]
```

Parameters

interface *interface*	(OPTIONAL) Enter the following keywords and slot/port or number information: • For the Management interface, enter the keyword `managementethernet` followed by the slot/port information. • For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information. • For a VLAN, enter the keyword `vlan` followed by a number from 1 to 4094.

ip *ip-address mask*	(OPTIONAL) Enter the keyword `ip` followed by an IP address in the dotted decimal format. Enter the optional IP address mask in the slash prefix format (/ x).
macaddress *mac-address mask*	(OPTIONAL) Enter the keyword `macaddress` followed by a MAC address in nn:nn:nn:nn:nn:nn format. Enter the optional MAC address mask in nn:nn:nn:nn:nn format also.
static	(OPTIONAL) Enter the keyword `static` to view entries entered manually.
retries	(OPTIONAL) Enter the keyword `retries` to view the number of ARP retries before a 20–second back off.
dynamic	(OPTIONAL) Enter the keyword `dynamic` to view dynamic entries.
summary	(OPTIONAL) Enter the keyword `summary` to view a summary of ARP entries.
inspection	(OPTIONAL) Enter the keyword `inspection` to view dynamic ARP Inspection details.

Command Modes

EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

The following describes the `show arp` command shown in the following example.

Row Heading	Description
Protocol	Displays the protocol type.
Address	Displays the IP address of the ARP entry.
Age(min)	Displays the age (in minutes) of the ARP entry.
Hardware Address	Displays the MAC address associated with the ARP entry.
Interface	Displays the first two letters of the interfaces type and the slot/port associated with the ARP entry.
VLAN	Displays the VLAN ID, if any, associated with the ARP entry.
CPU	Lists which CPU the entries are stored on.

Example

```
Dell#show arp

Protocol Address       Age(min)      Hardware Address
Interface     VLAN      CPU
-------------------------------------------------------------------
--------------------
Internet 10.11.8.6      167           00:01:e9:45:00:03   Ma
0/0       -         CP
Internet 10.11.68.14    124           00:01:e9:45:00:03   Ma
0/0       -         CP
```

```
Internet 10.11.209.254   0            00:01:e9:45:00:03   Ma
0/0       -         CP
```

Example (Private VLAN)

NOTE: In this example, Line 1 shows community VLAN 200 (in primary VLAN 10) in a PVLAN. Line 2 shows primary VLAN 10.

```
Dell#show arp

Protocol Address       Age(min)      Hardware Address
Interface     VLAN      CPU
--------------------------------------------------------------------
--------------------
Internet 5.5.5.1         -           00:01:e8:43:96:5e
-      Vl 10 pv 200  CP
Internet 5.5.5.10        -           00:01:e8:44:99:55
-      Vl 10         CP
Internet 10.1.2.4        1           00:01:e8:d5:9e:e2   Ma
0/0     -           CP
Internet 10.10.10.4      1           00:01:e8:d5:9e:e2   Ma
0/0     -           CP
Internet 10.16.127.53    1           00:01:e8:d5:9e:e2   Ma
0/0     -           CP
Internet 10.16.134.254   20          00:01:e8:d5:9e:e2   Ma
0/0     -           CP
Internet 133.33.33.4     1           00:01:e8:d5:9e:e2   Ma
0/0     -           CP
```

Usage Information

The following describes the `show arp summary` command shown in the following example.

Row Heading	Description
Total Entries	Lists the total number of ARP entries in the ARP table.
Static Entries	Lists the total number of configured or static ARP entries.
Dynamic Entries	Lists the total number of learned or dynamic ARP entries.
CPU	Lists which CPU the entries are stored on.

Example (Summary)

```
Dell#show arp summary

TotalEntries Static Entries Dynamic Entries CPU
-----------------------------------------------
3            0              3           CP
Dell#
```

show ip interface

View IP-related information on all interfaces.

Syntax `show ip interface [interface | brief] [configuration]`

Parameters

interface	(OPTIONAL) Enter the following keywords and slot/port or number information:

		• For the Management interface, enter the keyword `ManagementEthernet` followed by zero (0). • For a Port Channel interface, enter the keywords `port-channel` followed by a number. The range is from 1 to 128. • For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information. • For a VLAN, enter the keyword `vlan` followed by a number from 1 to 4094.
	brief	(OPTIONAL) Enter the keyword `brief` to view a brief summary of the interfaces and whether an IP address is assigned.
	configuration	(OPTIONAL) Enter the keyword `configuration` to display the physical interfaces with non-default configurations only.

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

The following describes the `show ip interface` command shown in the following example.

Lines	Description
TenGigabitEthernet 0/0...	Displays the interface's type, slot/port and physical and line protocol
Internet address...	States whether an IP address is assigned to the interface. If one is, that address is displayed.
IP MTU is...	Displays IP MTU value.
Inbound access...	Displays the name of the any configured incoming access list. If none is configured, the phrase "not set" is displayed.
Proxy ARP...	States whether proxy ARP is enabled on the interface.
Split horizon...	States whether split horizon for RIP is enabled on the interface.
Poison Reverse...	States whether poison for RIP is enabled on the interface
ICMP redirects...	States if ICMP redirects are sent.
ICMP unreachables...	States if ICMP unreachable messages are sent.

Example

```
Dell#show ip int te 0/0
TenGigabitEthernet 0/0 is down, line protocol is down
Internet address is not set
IP MTU is 1500 bytes
```

```
Inbound access list is not set
Proxy ARP is enabled
Split Horizon is enabled
Poison Reverse is disabled
ICMP redirects are not sent
ICMP unreachables are not sent
Dell#
```

Usage Information

The following describes the `show ip interface brief` command shown in the following example.

Fields	Description
Interface	Displays type of interface and the associated slot and port number.
IP-Address	Displays the IP address for the interface, if configured.
Ok?	Indicates if the hardware is functioning properly.
Method	Displays "Manual" if the configuration is read from the saved configuration.
Status	States whether the interface is enabled (up) or disabled (administratively down).
Protocol	States whether IP is enabled (up) or disabled (down) on the interface.

Example (Brief)

```
Dell#show ip int brief
Interface             IP-Address  OK? Method Status Protocol
TenGigabitEthernet 0/1 unassigned NO  None   up       down
TenGigabitEthernet 0/2 unassigned YES None   up       up
TenGigabitEthernet 0/3 unassigned YES None   up       up
TenGigabitEthernet 0/4 unassigned NO  None   up     down
TenGigabitEthernet 0/5 unassigned NO  None   up     down
TenGigabitEthernet 0/6 unassigned NO  None   up     down
TenGigabitEthernet 0/7 unassigned NO  None   up     down
TenGigabitEthernet 0/8 unassigned NO  None   up     down
TenGigabitEthernet 0/9 unassigned NO  None   up     down
```

show ip management-route

View the IP addresses assigned to the Management interface.

Syntax `show ip management-route [all | connected | summary | static]`

Parameters

all	(OPTIONAL) Enter the keyword `all` to view all IP addresses assigned to all Management interfaces on the switch.
connected	(OPTIONAL) Enter the keyword `connected` to view only routes directly connected to the Management interface.
summary	(OPTIONAL) Enter the keyword `summary` to view a table listing the number of active and non-active routes and their sources.

	static	(OPTIONAL) Enter the keyword `static` to view non-active routes also.

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on M I/O Aggregator.

Example

```
Dell#show ip management-route
Destination    Gateway                 State
-----------    -------                 -----
10.1.2.0/24    ManagementEthernet 0/0  Connected
172.16.1.0/24   10.1.2.4               Active
Dell#
```

show ip multicast-cam stack-unit

Displays content-addressable memory (CAM) entries.

Syntax

```
show ip multicast-cam stack-unit 0-5 port-set pipe-number [ip-address mask [longer-prefixes] | detail | member-info | summary]
```

Parameters

0-5	Enter the stack-unit ID, from 0 to 5.
pipe-number	Enter the number of the Port-Pipe number. The range is from 0 to 0.
ip-address mask [longer-prefix]	(OPTIONAL) Enter the IP address and mask of a route to CAM entries for that route only. Enter the keyword `longer-prefixes` to view routes with a common prefix.
detail	Enter the keyword `detail` to display the group index ID used by the ecmp routes int he CAM.
member-info	Enter the keyword `member-info` to display the group index used by the ecmp, the number of egress ports (members) for the ecmp, and the port details of each member. The detail information under `member-info` will give the MAC address, VLAN ID and gateway of every member port of the ecmp.
summary	(OPTIONAL) Enter the keyword `summary` to view a table listing route prefixes and the total number routes which can be entered in to CAM.

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

The following describes the `show ip fib stack-unit` command shown in the following example.

Field	Description
Destination	Displays the destination route of the index.
CG	Displays 0.
V	Displays a 1 if the entry is valid and a 0 otherwise.
C	Displays the CPU bit. 1 indicates that a packet hitting this entry is forwarded to the control processor, depending on Egress port.
V Id	Displays the VLAN ID. If the entry is 0, the entry is not part of a VLAN.
Mac Addr	Displays the next-hop router's MAC address.
Port	Displays the egress interface. Use the second half of the entry to determine the interface. For example, in the entry 17cl CP, the CP is the pertinent portion. • CP = control processor • Fo= 40 Gigabit Ethernet interface • Te = 10 Gigabit Ethernet interface

Example

```
Dell#show ip multicast-cam stack-unit 0 port-set 0
10.10.10.10/32
longer-prefixes
Destination    EC    CG    V    C  VId   Mac-Addr        Port
---------------- -- -- - - ----- -----------------
-------------
10.10.10.10          0     0   1   1 0 00:00:00:00:00:00
3f01 CP
Dell#
```

show ip route

View information, including how they were learned, about the IP routes on the switch.

Syntax

```
show ip route [hostname | ip-address [mask] [longer-prefixes] |
list prefix-list [process-id] | connected | static | summary]
```

Parameters

ip-address	(OPTIONAL) Specify a name of a device or the IP address of the device to view more detailed information about the route.
mask	(OPTIONAL) Specify the network mask of the route. Use this parameter with the IP address parameter.
longer-prefixes	(OPTIONAL) Enter the keywords `longer-prefixes` to view all routes with a common prefix.
list *prefix-list*	(OPTIONAL) Enter the keyword `list` and the name of a configured prefix list.
process-id	(OPTIONAL) Specify that only OSPF routes with a certain process ID must be displayed.
connected	(OPTIONAL) Enter the keyword `connected` to view only the directly connected routes.
static	(OPTIONAL) Enter the keyword `static` to view only routes configured by the `ip route` command.
summary	(OPTIONAL) Enter the keyword `summary`.

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

The following describes the `show ip route all` command in the following example.

Field	Description
(undefined)	Identifies the type of route: • C = connected • S = static • R = RIP • B = BGP • IN = internal BGP • EX = external BGP • LO = Locally Originated • O = OSPF • IA = OSPF inter area • N1 = OSPF NSSA external type 1 • N2 = OSPF NSSA external type 2 • E1 = OSPF external type 1 • E2 = OSPF external type 2 • i = IS-IS

Field	Description
	• L1 = IS-IS level-1 • L2 = IS-IS level-2 • IA = IS-IS inter-area • * = candidate default • > = non-active route • + = summary routes
Destination	Identifies the route's destination IP address.
Gateway	Identifies whether the route is directly connected and on which interface the route is configured.
Dist/Metric	Identifies if the route has a specified distance or metric.
Last Change	Identifies when the route was last changed or configured.

Example

Example (Summary)

```
Dell#show ip route summary
Route Source       Active Routes     Non-active Routes
connected              2                 0
static                 1                 0
Total                  3                 0
Total 3 active route(s) using 612 bytes
Dell#show ip route static ?
|                Pipe through a command
<cr>
Dell#show ip route static
      Destination    Gateway                  Dist/Metric
Last Change
      -----------    -------                   -----------
-----------
*S    0.0.0.0/0      via 10.10.91.9, Te 1/2       1/0
3d2h
Dell#
```

show tcp statistics

View information on TCP traffic through the switch.

Syntax	`show tcp statistics`	
Command Modes	EXEC Privilege	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.
Usage Information	The following describes the `show tcp statistics cp` command shown in the following example.	

Field	Description
Rcvd:	Displays the number and types of TCP packets received by the switch. • Total = total packets received • no port = number of packets received with no designated port
0 checksum error...	Displays the number of packets received with the following: • checksum errors • bad offset to data • too short
329 packets...	Displays the number of packets and bytes received in sequence.
17 dup...	Displays the number of duplicate packets and bytes received.
0 partially...	Displays the number of partially duplicated packets and bytes received.
7 out-of-order...	Displays the number of packets and bytes received out of order.
0 packets with data after window	Displays the number of packets and bytes received that exceed the switch's window size.
0 packets after close	Displays the number of packet received after the TCP connection was closed.
0 window probe packets...	Displays the number of window probe and update packets received.
41 dup ack...	Displays the number of duplicate acknowledgement packets and acknowledgement packets with data received.
10184 ack...	Displays the number of acknowledgement packets and bytes received.
Sent:	Displays the total number of TCP packets sent and the number of urgent packets sent.
25 control packets...	Displays the number of control packets sent and the number retransmitted.
11603 data packets...	Displays the number of data packets sent.
24 data packets retransmitted	Displays the number of data packets resent.
355 ack..	Displays the number of acknowledgement packets sent and the number of packet delayed.

Field	Description
0 window probe...	Displays the number of window probe and update packets sent.
7 Connections initiated...	Displays the number of TCP connections initiated, accepted, and established.
14 Connections closed...	Displays the number of TCP connections closed, dropped.
20 Total rxmt...	Displays the number of times the switch tried to re-send data and the number of connections dropped during the TCP retransmit timeout period.
0 Keepalive....	Lists the number of keepalive packets in timeout, the number keepalive probes and the number of TCP connections dropped during keepalive.

Example

```
Dell#show tcp statistics

Rcvd: 9849 Total, 0 no port
0 checksum error, 0 bad offset, 0 too short
5735 packets (7919 bytes) in sequence
20 dup packets (2 bytes)
0 partially dup packets (0 bytes)
1 out-of-order packets (0 bytes)
0 packets ( 0 bytes) with data after window
0 packets after close
0 window probe packets, 0 window update packets
0 dup ack packets, 0 ack packets with unsend data
6671 ack packets (152813 bytes)
Sent: 6778 Total, 0 urgent packets
7 control packets
6674 data packets (152822 bytes)
12 data packets (1222 bytes) retransmitted
85 ack only packets (5677 delayed)
0 window probe packets, 0 window update packets
0 Connections initiated, 7 connections accepted, 7 connections
established
8 Connections closed (including 4 dropped, 0 embryonic dropped)
12 Total rxmt timeout, 1 connections dropped in rxmt timeout
26 Keepalive timeout, 25 keepalive probe, 1 Connections
dropped in keepalive
Dell#
```

13

iSCSI Optimization

Internet small computer system interface (iSCSI) optimization enables quality-of-service (QoS) treatment for iSCSI storage traffic on an Aggregator.

NOTE: When iSCSI storage devices are detected on the server-ports, storm-control is disabled on those ports. When the iSCSI devices are off the ports, storm-control is enabled again.

The following commands are used to verify the iSCSI Optimization feature:

- show iscsi
- show iscsi sessions
- show iscsi sessions detailed

show iscsi

Display the currently configured iSCSI settings.

Syntax

```
show iscsi
```

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Example

```
Dell#show iscsi
iSCSI is enabled
iSCSI COS : dot1p is 4 no-remark
Session aging time: 10
Maximum number of connections is 256
-----------------------------------------------
iSCSI Targets and TCP Ports:
-----------------------------------------------
TCP Port Target IP Address
3260
860
Dell#
```

Related Commands

- show iscsi sessions— displays information on active iSCSI sessions on the switch.
- show iscsi session detailed— displays detailed information on active iSCSI sessions on the switch.

show iscsi sessions

Display information on active iSCSI sessions on the switch.

Syntax

```
show iscsi sessions
```

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Example

```
Dell# show isci sessions
Session 0:

Target: iqn.2001-05.com.equallogic:
0-8a0906-0e70c2002-10a0018426a48c94-iom010
Initiator: iqn.1991-05.com.microsoft:win-x9l8v27yajg
ISID: 400001370000

Session 1:

Target: iqn.2001-05.com.equallogic:
0-8a0906-0f60c2002-0360018428d48c94-iom011
Initiator: iqn.1991-05.com.microsoft:win-x9l8v27yajg
ISID: 400001370000.
```

Related Commands

- show iscsi— displays the currently configured iSCSI settings.
- show iscsi sessions detailed — displays detailed information on active iSCSI sessions on the switch.

show iscsi sessions detailed

Displays detailed information on active iSCSI sessions on the switch.

Syntax

```
show iscsi sessions detailed [session isid]
```

Parameters

isid	Enter the session's iSCSi ID to display detailed information on specified iSCSi session.

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Example

```
Dell# show isci sessions detailed
Session 0 :
-------------------------------------------------------------------
```

```
--------------
Target:iqn.2010-11.com.ixia:ixload:iscsi-TG1
Initiator:iqn.2010-11.com.ixia.ixload:initiator-iscsi-2c
Up Time:00:00:01:28(DD:HH:MM:SS)
Time for aging out:00:00:09:34(DD:HH:MM:SS)
ISID:806978696102
Initiator    Initiator    Target      Target  Connection
IP Address    TCP Port    IP Address  TCPPort    ID
10.10.0.44     33345        .10.0.101  3260            0
Session 1 :
-----------------------------------------------------------------
--------------
Target:iqn.2010-11.com.ixia:ixload:iscsi-TG1
Initiator:iqn.2010-11.com.ixia.ixload:initiator-iscsi-35
Up Time:00:00:01:22(DD:HH:MM:SS)
Time for aging out:00:00:09:31(DD:HH:MM:SS)
ISID:806978696102
Initiator Initiator Target Target Connection
IP Address TCP Port IP Address TCPPort ID
10.10.0.53 33432 10.10.0.101 3260 0
```

Related Commands

- show iscsi — displays the currently configured iSCSI settings.
- show iscsi sessions — displays information about active iSCSI sessions on the switch.

14

Isolated Networks

This chapter describes the isolated networks commands in the Dell Networking OS.

io-aggregator isolated-network vlan

Enable the isolated-network functionality for a particular VLAN or a set of VLANs.

Syntax	`[no] io-aggregator isolated-network vlan vlan-range`	
Parameters	**isolated-network**	Specify an isolated network to be configured
	vlan *vlan-range*	Enter the keyword vlan followed by the member VLANs using VLAN IDs (separated by commas), a range of VLAN IDs (separated by a hyphen), a single VLAN ID, or a combination. For example: VLAN IDs (comma-separated): 3, 4, 6. Range (hyphen-separated): 5-10. Combination: 3, 4, 5-10, 8.
Defaults	Not configured.	
Command Modes	CONFIGURATION	
Usage Information	To add more VLANs into an isolated network, you can enter this same command at any later point. The VLANs specified are appended to the existing set of VLANs. To remove a VLAN or a set of VLANs from an isolated network, use the no form of command.	
Command History	**Version 9.5(0.0)**	Supported on the M I/O aggregator.
Example	`Dell(conf)#io-aggregator isolated-network vlan 5-10`	

show io-aggregator isolated-networks

Display the VLANs that are configured to be part of an isolated network on an Aggregator.

Syntax	`show io-aggregator isolated-networks`

Parameters	**isolated-networks**	Specify an isolated network to be configured
	vlan *vlan-range*	Enter the keyword vlan followed by the member VLANs using VLAN IDs (separated by commas), a range of VLAN IDs (separated by a hyphen), a single VLAN ID, or a combination. For example: VLAN IDs (comma-separated): 3, 4, 6. Range (hyphen-separated): 5-10. Combination: 3, 4, 5-10, 8.
Defaults	None	
Command Modes	EXEC Privilege	
Usage Information	This command is used to show the isolated-network feature status and the VLANs configured for this feature. Show running-config will save this command under io-aggregator.	
Command History	**Version 9.5(0.0)**	Supported on the M I/O aggregator.

Example

```
Dell#show io-aggregator isolated-networks
Isolated Network Enabled VLANs : 5-10
```

15
Link Aggregation Control Protocol (LACP)

This chapter contains commands for Dell Networking's implementation of the link aggregation control protocol (LACP) for the creation of dynamic link aggregation groups (LAGs — called *port-channels* in Dell Networking OS parlance).

clear lacp counters

Clear Port Channel counters.

Syntax	`clear lacp` *`port-channel-number`* `counters`	
Parameters	***port-channel-number***	Enter a port-channel number: The range is from 1 to 128.
Command Modes	EXEC EXEC Privilege	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.
Related Commands	show lacp — displays the LACP configuration.	

debug lacp

Debug LACP (events).

Syntax	`debug lacp [events | pdu interface [in | out]]` To disable LACP debugging, use the `no debug lacp [events | pdu interface [in | out]]` command.	
Parameters	**events**	(OPTIONAL) Enter the keyword `events` to debug the LACP event information.
	pdu in | out	(OPTIONAL) Enter the keyword `pdu` to debug the LACP Protocol Data Unit information. Optionally, enter an `in` or `out` parameter to:

		• Receive enter `in` • Transmit enter `out`
	***interface* in | out**	Enter the following keywords and slot/port or number information: • For a Ten-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information.

Defaults none

Command Modes EXEC

EXEC Privilege

Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

show lacp

Displays the LACP matrix.

Syntax `show lacp` *`port-channel-number`* `[sys-id | counters]`

Parameters

port-channel-number	Enter a port-channel number: The range is from 1 to 128.
sys-id	(OPTIONAL) Enter the keywords `sys-id` and the value that identifies a system.
counters	(OPTIONAL) Enter the keyword `counters` to display the LACP counters.

Command Modes

- EXEC
- EXEC Privilege

Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

Example (Port-Channel-Number)

```
Dell#show lacp 128
Port-channel 1 admin up, oper up, mode lacp
Actor   System ID:Priority 32768, Address 0001.e800.a12b
Partner System ID:Priority 32768, Address 0001.e801.45a5
                  Actor Admin Key 1, Oper Key 1, Partner Oper
Key 1
                  LACP LAG 1 is an aggregatable link
```

```
A-Active LACP, B-Passive LACP, C-Short Timeout, D-Long Timeout
E-Aggregatable Link, F-Individual Link, G-IN_SYNC, H-
OUT_OF_SYNC
I-Collection enabled, J-Collection disabled, K-Distribution
enabled L-Distribution disabled,
M-Partner Defaulted, N-Partner Non-defaulted, O-Receiver is in
expired state,
P-Receiver is not in expired state

Port Te 0/1 is enabled, LACP is enabled and mode is lacp
  Actor   Admin: State ACEHJLMP Key 1    Priority 128
           Oper: State ACEGIKNP Key 1    Priority 128
  Partner Admin: State BDFHJLMP Key 0    Priority 0
           Oper: State BCEGIKNP Key 1    Priority 128
Dell#
```

Example (Sys-id)

```
Dell#show lacp 1 sys-id
Actor    System ID: Priority 32768, Address 0001.e800.a12b
Partner  System ID: Priority 32768, Address 0001.e801.45a5

Dell#
```

Example (Counter)

```
Dell#show lacp 1 counters
-----------------------------------------------------
           LACP PDU    Marker PDU   Unknown   Illegal
Port     Xmit   Recv   Xmit Recv      Pkts Rx   Pkts Rx
-----------------------------------------------------
TenGig 0/1  200  200     0    0        0          0
Dell#
```

Related Commands

clear lacp counters—Clears the LACP counters.

show interfaces port-channel—Displays the information on configured Port Channel groups.

show link-bundle-distribution port-channel

Display the traffic-handling and utilization of the member interfaces of the port channel.

Syntax

```
show link-bundle-distribution port-channel
```

Command Modes

EXEC

EXEC Privilege

Command History

Version 9.3.0.0	Introduced on the M I/O Aggregator

Usage Information

The following table describes the output fields of this `show` command:

Field	Description
Link-bundle trigger threshold	Threshold value that is the checkpoint, exceeding which the link bundle is

Field	Description
	marked as being overutilized and alarm is generated
LAG bundle number	Number of the LAG bundle
Utilization (In Percent)	Traffic usage in percentage of the packets processed by the port channel
Alarm State	Indicates whether an alarm is generated if overutilization of the port channel occurred. Possible values are Active and Inactive
Interface	Slot and port number, and the type of the member interface of the port channel
Line Protocol	Indicates whether the interface is administratively up or down
Utilization (In Percent)	Traffic usage in percentage of the packets processed by the particular member interface

Example

```
Dell#show link-bundle-distribution port-channel
Link-bundle trigger threshold - 60

LAG bundle - 1      Utilization[In Percent] - 0      Alarm
State - Inactive

Interface               Line Protocol   Utilization[In
Percent]
Te 0/5                  Up              0
Te 0/13                 Up              0
```

16

Layer 2

This chapter describes commands to configure Layer 2 features.

This chapter contains the following sections:

- MAC Addressing Commands
- Virtual LAN (VLAN) Commands

MAC Addressing Commands

The following commands are related to configuring, managing, and viewing MAC addresses:

- clear mac-address-table dynamic
- show cam mac stack-unit

Virtual LAN (VLAN) Commands

The following commands configure and monitor virtual local area networks (VLANs). VLANs are a virtual interface and use many of the same commands as physical interfaces.

You can configure an IP address and Layer 3 protocols on a VLAN called Inter-VLAN routing. FTP, TFTP, ACLs and SNMP are not supported on a VLAN.

For more information, also refer to Virtual LAN (VLAN) Commands.

clear mac-address-table dynamic

Clear the MAC address table of all MAC address learned dynamically.

Syntax

```
clear mac-address-table dynamic {address mac-address | all |
interface interface | vlan vlan-id}
```

Parameters

address *mac-address*	Enter the keyword `address` followed by a MAC address in nn:nn:nn:nn:nn:nn format.
all	Enter the keyword `all` to delete all MAC address entries in the MAC address table.

	interface *interface*	Enter the following keywords and slot/port or number information: • For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information.
	vlan *vlan-id*	Enter the keyword `vlan` followed by a VLAN ID number from 1 to 4094.
Command Modes	EXEC Privilege	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

description

Add a description about the selected VLAN.

Syntax	`description` *description* To remove the description from the VLAN, use the `no description` command.	
Parameters	***description***	Enter a text string description to identify the VLAN (80 characters maximum).
Defaults	none	
Command Modes	INTERFACE VLAN	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.
Related Commands	show vlan – displays the VLAN configuration.	

show cam mac stack-unit

Display the content addressable memory (CAM) size and the portions allocated for MAC addresses and for MAC ACLs.

Syntax	`show cam mac stack-unit` *unit_number* `port-set` *port-pipe* `count [vlan` *vlan-id*`] [interface` *interface*`]`

Parameters

stack-unit *unit_number*	(REQUIRED) Enter the keyword `stack-unit` followed by a stack member number to select the stack unit for which to gather information. The range is 0 to 5.
port-set *port-pipe*	(REQUIRED) Enter the keywords `port-set` followed by a Port-Pipe number to select the Port-Pipe for which to gather information. The range is 0.
address *mac-addr*	(OPTIONAL) Enter the keyword `address` followed by a MAC address in the nn:nn:nn:nn:nn:nn format to display information on that MAC address.
dynamic	(OPTIONAL) Enter the keyword `dynamic` to display only those MAC addresses learned dynamically by the switch.
static	(OPTIONAL) Enter the keyword `static` to display only those MAC address specifically configured on the switch.
interface *interface*	(OPTIONAL) Enter the keyword `interface` followed by the interface type, slot and port information: • For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information.
vlan *vlan-id*	(OPTIONAL) Enter the keyword `vlan` followed by the VLAN ID to display the MAC address assigned to the VLAN. The range is from 1 to 4094.

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

17

Link Layer Discovery Protocol (LLDP)

The link layer discovery protocol (LLDP) advertises connectivity and management from the local station to the adjacent stations on an IEEE 802 LAN. LLDP facilitates multi-vendor interoperability by using standard management tools to discover and make available a physical topology for network management. The Dell Networking OS implementation of LLDP is based on IEEE standard 801.1ab.

This chapter contains the following commands, in addition to the commands:

- clear lldp counters
- debug lldp interface
- protocol lldp (Configuration)
- protocol lldp (Interface)
- show lldp neighbors
- show lldp statistics

The starting point for using LLDP is invoking LLDP with the `protocol lldp` command in either CONFIGURATION or INTERFACE mode.

The information LLDP distributes is stored by its recipients in a standard management information base (MIB). You can access the information by a network management system through a management protocol such as simple network management protocol (SNMP).

For details about implementing LLDP/LLDP-MED, refer to the Link Layer Discovery Protocol chapter of the *Dell PowerEdge M I/O Aggregator Configuration Guide*.

clear lldp counters

Clear LLDP transmitting and receiving counters for all physical interfaces or a specific physical interface.

Syntax `clear lldp counters` *interface*

Parameters

interface	Enter the following keywords and slot/port or number information: • For a 10-Gigabit Ethernet interface, enter the keyword `tenGigabitEthernet` followed by the slot/port information.

Defaults none

Command Modes EXEC Privilege

Command History	Version 8.3.17.0	Supported on the M I/O Aggregator.

debug lldp interface

Enable LLDP debugging to display timer events, neighbor additions or deletions, and other information about incoming and outgoing packets.

Syntax

`debug lldp interface {`*`interface`* `| all}{events | packet {brief | detail} {tx | rx | both}}`

To disable debugging, use the `no debug lldp interface {`*`interface`* `| all}{events} {packet {brief | detail} {tx | rx | both}}` command.

Parameters

interface	Enter the following keywords and slot/port or number information: • For a 10-Gigabit Ethernet interface, enter the keyword `tenGigabitEthernet` followed by the slot/port information.
all	(OPTIONAL) Enter the keyword `all` to display information on all interfaces.
events	(OPTIONAL) Enter the keyword `events` to display major events such as timer events.
packet	(OPTIONAL) Enter the keyword `packet` to display information regarding packets coming in or going out.
brief	(OPTIONAL) Enter the keyword `brief` to display brief packet information.
detail	(OPTIONAL) Enter the keyword `detail` to display detailed packet information.
tx	(OPTIONAL) Enter the keyword `tx` to display transmit-only packet information.
rx	(OPTIONAL) Enter the keyword `rx` to display receive-only packet information.
both	(OPTIONAL) Enter the keyword `both` to display both receive and transmit packet information.

Defaults none

Command Modes EXEC Privilege

Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

protocol lldp (Configuration)

Enable LLDP globally on the switch.

Syntax	`protocol lldp` To disable LLDP globally on the chassis, use the `no protocol lldp` command.
Defaults	Enabled.
Command Modes	CONFIGURATION (conf-lldp)
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.

protocol lldp (Interface)

Enter the LLDP protocol in the INTERFACE mode.

Syntax	`[no] protocol lldp` To return to the global LLDP configuration mode, use the `no protocol lldp` command from Interface mode.
Defaults	Enabled
Command Modes	INTERFACE (conf-if-*interface*-lldp)
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.
Usage Information	By default, protocol lldp is enabled, To disable, use the `no protocol lldp` command. When you enter the `LLDP` protocol in the Interface context, it overrides global configurations. When you execute the `no protocol lldp` from INTERFACE mode, interfaces begin to inherit the configuration from global LLDP CONFIGURATION mode.

show lldp neighbors

Display LLDP neighbor information for all interfaces or a specified interface.

Syntax

```
show lldp neighbors [interface] [detail]
```

Parameters

interface	(OPTIONAL) Enter the following keywords and slot/port or number information: • For a 10-Gigabit Ethernet interface, enter the keyword `tenGigabitEthernet` then the slot/port information.
detail	(OPTIONAL) Enter the keyword `detail` to display all the TLV information, timers, and LLDP tx and rx counters.

Defaults none

Command Modes EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information Omitting the keyword `detail` displays only the remote chassis ID, Port ID, and Dead Interval.

Example

```
Dell (conf-if-te-1/31)#do show lldp neighbors
Loc PortID    Rem Host Name  Rem Port Id             Rem
Chassis Id
-------------------------------------------------------------------
----------
Te 1/37       FTOS         TenGigabitEthernet 0/37
00:01:e8:05:40:46
Te 1/38       FTOS         TenGigabitEthernet 0/38
00:01:e8:05:40:46
Te 1/39       FTOS         TenGigabitEthernet 0/39
00:01:e8:05:40:46
Te 1/40       FTOS         TenGigabitEthernet 0/40
00:01:e8:05:40:46
Dell (conf-if-te-1/31)#
```

show lldp statistics

Displays the LLDP statistical information.

Syntax

```
show lldp statistics
```

Defaults none

Command Modes EXEC Privilege

Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.

Example

```
Dell#show lldp statistics
--------- LLDP GLOBAL STATISTICS ON CHASSIS ------------
Total number of neighbors: 4
Last table change time: 00:01:17, In ticks: 3859
Total number of Table Inserts: 7
Total number of Table Deletes: 3
Total number of Table Drops: 0
Total number of Table Age Outs: 0
Dell#
```

18

Port Monitoring

The port monitoring feature allows you to monitor network traffic by forwarding a copy of each incoming or outgoing packet from one port to another port.

Important Points to Remember

- Port monitoring is supported on physical ports only. Port-channel interfaces and virtual local area networks (VLANs), are not supported.
- The monitoring (destination, "MG") and monitored (source, "MD") ports must be on the same switch.
- The monitored (source) interface must be a server-facing interface in the format slot/port, where valid slot numbers are 0-1 and server-facing port numbers are from 1 to 32. The monitoring interface must be an uplink port in the chassis.
- Dell Networking OS permits a limited set of commands for monitoring ports. To display these commands, use the ? command.
- Only one MG and one MD may be in a single port-pipe.
- A monitoring port may not be a member of a VLAN.
- There may only be one destination port in a monitoring session.
- A source port (MD) can only be monitored by one destination port (MG). If you try to assign a monitored port to more than one monitoring port, the following error is displayed as shown in example.

Example

```
Dell(conf)#mon ses 1
Dell(conf-mon-sess-1)#source tengig 0/0 destination tengig
0/60 direction both
Dell(conf-mon-sess-1)#do show mon ses
SessionID Source      Destination  Direction  Mode  Type
--------- ------      -----------  ---------  ----  ----
     1    TenGig 0/0  TenGig 0/60  both            interface
Port-based
Dell(conf-mon-sess-1)#mon ses 2
Dell(conf-mon-sess-2)#source tengig 0/0 destination tengig
0/61 direction both
% Error: MD port is already being monitored.
```

NOTE: There is no limit to the number of monitoring sessions per system, provided that there are only four destination ports per port-pipe. If each monitoring session has a unique destination port, the maximum number of session is four per port-pipe.

description

Enter a description of this monitoring session.

Syntax	`description {description}` To remove the description, use the `no description {description}` command.
Parameters	**description** — Enter a description regarding this session (80 characters maximum).
Defaults	none
Command Modes	MONITOR SESSION (conf-mon-*sess-session-ID*)
Command History	**Version 8.3.17.0** — Supported on the M I/O Aggregator.
Related Commands	monitor session—enables a monitoring session.

monitor session

Create a session for monitoring traffic with port monitoring.

Syntax	`monitor session session-ID` To delete a session, use the `no monitor session session-ID` command. To delete all monitor sessions, use the `no monitor session all` command.
Parameters	***session-ID*** — Enter a session identification number. The range is from 0 to 65535.
Defaults	none
Command Modes	CONFIGURATION
Command History	**Version 8.3.17.0** — Supported on M I/O Aggregator
Usage Information	The `monitor` command is saved in the running configuration at Monitor Session mode level and can be restored after a chassis reload.
Example	`Dell(conf)# monitor session 60` `Dell(conf-mon-sess-60)`

Related Command	show monitor session — Displays the monitor session. show running-config monitor session — Displays the running configuration of a monitor session.

show config

Display the current monitor session configuration.

Syntax	`show config`
Defaults	none
Command Modes	MONITOR SESSION (conf-mon-*sess-session-ID*)
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.

Example	`Dell(conf-mon-sess-5)#show config`
	`!`
	`monitor session 5`
	`source TenGigabitEthernet 0/4 destination TenGigabitEthernet 0/43 direction rx`
	`Dell(conf-mon-sess-5)#`

show monitor session

Display the monitor information of a particular session or all sessions.

Syntax	`show monitor session {`*`session-ID`*`}` To display monitoring information for all sessions, use the `show monitor session` command.
Parameters	***session-ID*** (OPTIONAL) Enter a session identification number. The range is from 0 to 65535.
Defaults	none
Command Modes	• EXEC • EXEC Privilege
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.

Example

```
Dell#show monitor session 5
SessionID Source   Destination Direction Mode      Type
--------- ------   ----------- --------- ----      ----
  5        Te 0/4  Te 0/43       rx     interface  Port-based
Dell#
```

Related Commands

monitor session— creates a session for monitoring.

show running-config monitor session

Displays the running configuration of all monitor sessions or a specific session.

Syntax

`show running-config monitor session {session-ID}`

To display the running configuration for all monitor sessions, use the `show running-config monitor session` command.

Parameters

session-ID	(OPTIONAL) Enter a session identification number. The range is from 0 to 65535.

Defaults

none

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

The `monitoring` command is saved in the running configuration at the Monitor Session mode level and can be restored after a chassis reload.

Example

```
Dell#show run monitor session
!
monitor session 5
source TenGigabitEthernet 0/4 destination TenGigabitEthernet
0/43 direction rx
!
monitor session 20
source TenGigabitEthernet 0/3 destination TenGigabitEthernet
0/42 direction both
Dell#
Dell#show run monitor session 20
!
monitor session 20
source TenGigabitEthernet 0/3 destination TenGigabitEthernet
0/42 direction both
Dell#
```

Related Commands

monitor session— creates a session for monitoring.

show monitor session— displays a monitor session.

source (port monitoring)

Configure a port monitor source.

Syntax

`source` *`interface`* `destination` *`interface`* `direction {rx | tx | both}`

To disable a monitor source, use the `no source` *`interface`* `destination` *`interface`* `direction {rx | tx | both}` command.

Parameters

interface	Enter the one of the following keywords and slot/port information: • For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` then the slot/port information.
destination	Enter the keyword `destination` to indicate the interface destination.
direction {rx | tx | both}	Enter the keyword `direction` followed by one of the packet directional indicators. • `rx`: to monitor receiving packets only. • `tx`: to monitor transmitting packets only. • `both`: to monitor both transmitting and receiving packets.

Defaults

none

Command Modes

MONITOR SESSION (conf-mon-*sess-session-ID*)

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Example

```
Dell(conf-mon-sess-11)#source tengig 10/0 destination tengig
10/47 direction
rx
Dell(conf-mon-sess-11)#
```

Usage Information

The monitored (source) interface must be a server-facing interface in the format slot/port, where valid slot numbers are 0-1 and server-facing port numbers are from 1 to 32.

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Quality of Service (QoS)

The Dell Networking OS commands for quality of service (QoS) include traffic conditioning and congestion control.

This chapter contains the following section:

- Policy-Based QoS Commands

Policy-Based QoS Commands

Policy-based traffic classification is handled with class maps. These maps classify unicast traffic into one of four classes. The system allows you to match multiple class maps and specify multiple match criteria. Policy-based QoS is not supported on logical interfaces, such as port-channels, VLANs, or Loopbacks.

The commands are:

- show qos statistics
- show qos dot1p-queue-mapping

show qos dot1p-queue-mapping

View dot1p to queue mapping.

Syntax	`show qos dot1p-queue-mapping`
Defaults	none
Command Modes	• EXEC • EXEC Privilege
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.

Example	`Dell#show qos dot1p-queue-mapping`
	`Dot1p Priority : 0 1 2 3 4 5 6 7`
	`Queue : 0 0 0 1 2 3 3 3`
	`Dell#`

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Security for M I/O Aggregator

Security features are supported on the M I/O Aggregator.

This chapter describes several ways to provide access security to the Dell Networking system.

For details about all the commands described in this chapter, refer to the *Security* chapter in the *Dell Networking OS Command Reference Guide*.

AAA Accounting Commands

AAA Accounting enables tracking of services that users are accessing and the amount of network resources being consumed by those services. When you enable AAA Accounting, the network server reports user activity to the TACACS+ security server in the form of accounting records. Each accounting record is comprised of accounting AV pairs and is stored on the access control server.

As with authentication and authorization, you must configure AAA Accounting by defining a named list of accounting methods, and then applying that list to various interfaces.

aaa accounting

Enable AAA Accounting and create a record for monitoring the accounting function.

Syntax

```
aaa accounting {system | exec | commands level} {name |
default}{start-stop | wait-start | stop-only} {tacacs+}
```

To disable AAA Accounting, use the `no aaa accounting {system | exec | command level} {name | default}{start-stop | wait-start | stop-only} {tacacs+}` command.

Parameters

system	Enter the keyword `system` to send accounting information of any other AAA configuration.
exec	Enter the keyword `exec` to send accounting information when a user has logged in to EXEC mode.
commands *level*	Enter the keyword `command` then a privilege level for accounting of commands executed at that privilege level.
name **| default**	Enter one of the following: • For `name`, enter a user-defined name of a list of accounting methods.

- For `default`, the default accounting methods used.

start-stop	Enter the keywords `start-stop` to send a "start accounting" notice at the beginning of the requested event and a "stop accounting" notice at the end of the event.
wait-start	Enter the keywords `wait-start` to ensure that the TACACS + security server acknowledges the start notice before granting the user's process request.
stop-only	Enter the keywords `stop-only` to instruct the TACACS+ security server to send a "stop record accounting" notice at the end of the requested user process.
tacacs+	Enter the keyword `tacacs+` to use TACACS+ data for accounting. Dell Networking OS currently only supports TACACS+ accounting.

Defaults none

Command Modes CONFIGURATION

Command History This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.4(0.0)	Introduced on the I/O Aggregator.
Version 9.0.2.0	Introduced on the S6000.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.11.1	Introduced on the Z9000.
Version 8.3.7.0	Introduced on the S4810.
Version 7.6.1.0	Introduced on the S-Series.
Version 7.5.1.0	Introduced on the C-Series.
Version 6.3.1.0	Introduced on the E-Series.

Usage Information In the example above, TACACS+ accounting is used to track all usage of EXEC command and commands on privilege level 15.

Privilege level 15 is the default. If you want to track usage at privilege level 1 for example, use the `aaa accounting command 1` command.

Example

```
Dell(conf)# aaa accounting exec default start-stop tacacs+
Dell(conf)# aaa accounting command 15 default start-stop tacacs
+
Dell(config)#
```

Related Commands	enable password — changes the password for the `enable` command. login authentication — enables AAA login authentication on the terminal lines. tacacs-server host — specifies a TACACS+ server host.

aaa accounting suppress

Prevent the generation of accounting records of users with the user name value of NULL.

Syntax	`aaa accounting suppress null-username` To permit accounting records to users with user name value of NULL, use the `no aaa accounting suppress null-username` command.
Defaults	Accounting records are recorded for all users.
Command Modes	CONFIGURATION
Command History	This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*. The following is a list of the Dell Networking OS version history for this command.

Version 9.4. (0.0)	Introduced on the I/O Aggregator.
Version 9.0.2.0	Introduced on the S6000.
Version 8.3.19.0	Introduced on the S4280T.
Version 8.3.11.1	Introduced on the Z9000.
Version 8.3.7.0	Introduced on the S4810.
Version 7.6.1.0	Introduced on the S-Series.
Version 7.5.1.0	Introduced on the C-Series.
Version 6.3.1.0	Introduced on the E-Series.

Usage Information	Dell Networking OS issues accounting records for all users on the system, including users whose username string, due to protocol translation, is NULL. For example, a user who comes on line with the `aaa authentication login method-list none` command is applied. To prevent the accounting records from being generated for sessions that do not have user names associated to them, use the `aaa accounting suppress` command.

show accounting

Display the active accounting sessions for each online user.

Syntax	`show accounting`
Defaults	none
Command Modes	EXEC
Command History	This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*. The following is a list of the Dell Networking OS version history for this command.

Version 9.4(0.0)	Introduced on the I/O Aggregator.
Version 9.0.2.0	Introduced on the S6000.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.11.1	Introduced on the Z9000.
Version 8.3.7.0	Introduced on the S4810.
Version 7.6.1.0	Introduced on the S-Series.
Version 7.5.1.0	Introduced on the C-Series.
Version 6.3.1.0	Introduced on the E-Series.

Usage Information	This command steps through all active sessions and then displays the accounting records for the active account functions.

Example	`Dell#show accounting`
	`Active accounted actions on tty2, User admin Priv 1`
	`  Task ID 1, EXEC Accounting record, 00:00:39 Elapsed, service=shell`
	`Active accounted actions on tty3, User admin Priv 1`
	`  Task ID 2, EXEC Accounting record, 00:00:26 Elapsed, service=shell`
	`Dell#`

Related Commands	aaa accounting — enables AAA Accounting and creates a record for monitoring the accounting function.

Authentication and Password Commands

This section contains the following commands controlling management access to the system:

- enable password

- enable restricted
- service password-encryption
- show users
- username

aaa authentication enable

Configure AAA Authentication method lists for user access to EXEC privilege mode (the "Enable" access).

Syntax

`aaa authentication enable {default | method-list-name} method [... method2]`

To return to the default setting, use the `no aaa authentication enable {default | method-list-name} method [... method2]` command.

Parameters

default	Enter the keyword `default` then the authentication methods to use as the default sequence of methods for the Enable login. The default is `default enable`.
method-list-name	Enter a text string (up to 16 characters long) to name the list of enabled authentication methods activated at login.
method	Enter one of the following methods: • `enable`: use the password the `enable password` command defines in CONFIGURATION mode. • `line`: use the password the `password` command defines in LINE mode. • `none`: no authentication. • `radius`: use the RADIUS servers configured with the `radius-server host` command. • `tacacs+`: use the TACACS+ server(s) configured with the `tacacs-server host` command.
... method2	(OPTIONAL) In the event of a "no response" from the first method, Dell Networking Operating System (OS) applies the next configured method.

Defaults

Use the `enable` password.

Command Modes

CONFIGURATION

Command History

Version 9.3(0.0)	Introduced on the M I/O Aggregator.

Usage Information

By default, the `Enable password` is used. If you configure `aaa authentication enable default`, Dell Networking Operating System (OS) uses the methods defined for `Enable access` instead.

Methods configured with the `aaa authentication enable` command are evaluated in the order they are configured. If authentication fails using the primary method, Dell Networking Operating System (OS) employs the second method (or third method, if necessary) automatically. For example, if the TACACS+ server is reachable, but the server key is invalid, Dell Networking OS proceeds to the next authentication method. The TACACS+ is incorrect, but the user is still authenticated by the secondary method.

Related Commands

enable password — changes the password for the `enable` command.

login authentication — enables AAA login authentication on the terminal lines.

radius-server host — specifies a RADIUS server host.

tacacs-server host — specifies a TACACS+ server host.

aaa authentication login

Configure AAA Authentication method lists for user access to EXEC mode (`Enable log-in`).

Syntax

`aaa authentication login {`*`method-list-name`* `| default} `*`method`* `[... `*`method4`*`]`

To return to the default setting, use the `no aaa authentication login {`*`method-list-name`* `| default}` command.

Parameters

method-list-name	Enter a text string (up to 16 characters long) as the name of a user-configured method list that can be applied to different lines.
default	Enter the keyword `default` to specify that the method list specified is the default method for all terminal lines.
method	Enter one of the following methods: • `enable`: use the password the `enable password` command defines in CONFIGURATION mode. • `line`: use the password the `password` command defines in LINE mode. • `none`: no authentication. • `radius`: use the RADIUS servers configured with the `radius-server host` command. • `tacacs+`: use the TACACS+ servers configured with the `tacacs-server host` command.
... method4	(OPTIONAL) Enter up to four additional methods. In the event of a "no response" from the first method, Dell Networking Operating System (OS) applies the next configured method (up to four configured methods).

Defaults	Not configured (that is, no authentication is performed).
Command Modes	CONFIGURATION
Command History	**Version 9.3(0.0)** Introduced on the M I/O Aggregator.
Usage Information	By default, the locally configured username password is used. If you configure `aaa authentication login default`, Dell Networking Operating System (OS) uses the methods this command defines for login instead. Methods configured with the `aaa authentication login` command are evaluated in the order they are configured. If users encounter an error with the first method listed, Dell Networking Operating System (OS) applies the next method configured. If users fail the first method listed, no other methods are applied. The only exception is the local method. If the user's name is not listed in the local database, the next method is applied. If the correct user name/password combination is not entered, the user is not allowed access to the switch. **NOTE:** If authentication fails using the primary method, Dell Networking Operating System (OS) employs the second method (or third method, if necessary) automatically. For example, if the TACACS+ server is reachable, but the server key is invalid, Dell Networking Operating System (OS) proceeds to the next authentication method. The TACACS+ is incorrect, but the user is still authenticated by the secondary method. After configuring the `aaa authentication login` command, configure the `login authentication` command to enable the authentication scheme on terminal lines. Connections to the SSH server work with the following login mechanisms: local, radius, and tacacs.
Related Commands	login authentication — enables AAA login authentication on the terminal lines. radius-server host — specifies a RADIUS server host. tacacs-server host — specifies a TACACS+ server host.

banner exec

Configure a message that is displayed when your enter EXEC mode.

Syntax	`banner exec` *`c line c`* To delete a banner, use the `no banner exec` command.

Parameters

c	Enter the keywords `banner exec`, then enter a character delineator, represented here by the letter *c*. Press **ENTER**.
line	Enter a text string for your banner message ending the message with your delineator. In the following example, the delineator is a percent character (%); the banner message is "testing, testing".

Defaults No banner is displayed.

Command Modes CONFIGURATION

Command History

Version 9.3(0.0)	Introduced on the M I/O Aggregator.

Usage Information After entering the banner login command, type one or more spaces and a delineator character. Enter the banner text then the second delineator character. When the user is connected to the router, if a message of the day banner is configured, it displays first. If no message of the day banner is configured, the login banner and prompt appear. After the user has logged in, the EXEC banner (if configured) displays.

Example

```
Dell(conf)#banner exec ?
LINE c banner-text c, where 'c' is a delimiting character
Dell(conf)#banner exec %
Enter TEXT message. End with the character '%'.
This is the banner%
Dell(conf)#end
Dell#exit
4d21h5m: %RPM0-P:CP %SEC-5-LOGOUT: Exec session is terminated
for user on line
console

This is the banner

Dell con0 now available

Press RETURN to get started.
4d21h6m: %RPM0-P:CP %SEC-5-LOGIN_SUCCESS: Login successful for
user on line
console
This is the banner
Dell>
```

Related Commands

banner login — sets a banner for login connections to the system.

banner motd — sets a Message of the Day banner.

exec-banner— enables the display of a text string when you enter EXEC mode.

line — enables and configures the console and virtual terminal lines to the system.

banner login

Set a banner to display when logging on to the system.

Syntax

```
banner login {keyboard-interactive | no keyboard-interactive}
[c line c]
```

Parameters

keyboard-interactive	Enter the keyword `keyboard-interactive` to require a carriage return (CR) to get the message banner prompt.
c	Enter a delineator character to specify the limits of the text banner. The delineator is a percent character (%).
line	Enter a text string for your text banner message ending the message with your delineator. The delineator is a percent character (%). Range: maximum of 50 lines, up to 255 characters per line

Defaults

No banner is configured and the CR is required when creating a banner.

Command Modes

CONFIGURATION

Command History

Version 9.3(0.0)	Introduced on the M I/O Aggregator.

Usage Information

After entering the banner login command, type one or more spaces and a delineator character. Enter the banner text then the second delineator character. When the user is connected to the router, if a message of the day banner is configured, it displays first. If no message of the day banner is configured, the login banner and prompt appear. After the user has logged in, the EXEC banner (if configured) displays.

Example

```
Dell(conf)#banner login ?
keyboard-interactive Press enter key to get prompt
LINE c banner-text c, where 'c' is a delimiting character
Dell(conf)#no banner login ?
keyboard-interactive Prompt will be displayed by default
<cr>
Dell(conf)#banner login keyboard-interactive

Enter TEXT message. End with the character '%'.
This is the banner%
Dell(conf)#end
Dell#exit

13d21h9m: %RPM0-P:CP %SEC-5-LOGOUT: Exec session is terminated
for user on line console

This is the banner

Dell con0 now available

Press RETURN to get started.
13d21h10m: %RPM0-P:CP %SEC-5-LOGIN_SUCCESS: Login successful
for user on line console
This is the banner
Dell>
```

Related Commands	banner motd — sets a Message of the Day banner. exec-banner— enables the display of a text string when you enter EXEC mode.

banner motd

Set a message of the day (MOTD) banner.

Syntax	`banner motd c line c`	
Parameters	***c***	Enter a delineator character to specify the limits of the text banner. The delineator is a percent character (%).
	line	Enter a text string for your MOTD banner the message with your delineator. The delineator is a percent character (%).
Defaults	No banner is configured.	
Command Modes	CONFIGURATION	
Command History	**Version 9.3(0.0)**	Introduced on the M I/O Aggregator.
Usage Information	After entering the banner login command, type one or more spaces and a delineator character. Enter the banner text then the second delineator character. When the user is connected to the router, if a message of the day banner is configured, it displays first. If no message of the day banner is configured, the login banner and prompt appear. After the user has logged in, the EXEC banner (if configured) displays.	
Related Commands	banner exec — enables the display of a text string when you enter EXEC mode. banner login — sets a banner to display after successful login to the system.	

debug radius

View RADIUS transactions to assist with troubleshooting.

Syntax	`debug radius` To disable debugging of RADIUS, use the `no debug radius` command.
Defaults	Disabled.

Command Modes	EXEC Privilege	
Command History	**Version 9.3. (0.0)**	Introduced on the M I/O Aggregator.

debug tacacs+

To assist with troubleshooting, view TACACS+ transactions.

Syntax	`debug tacacs+` To disable debugging of TACACS+, use the `no debug tacacs+` command.
Defaults	Disabled.
Command Modes	EXEC Privilege
Command History	**Version 9.3.0.0** Introduced on the M I/O Aggregator.

exec-banner

Enable the display of a text string when the user enters EXEC mode.

Syntax	`exec-banner` To disable the banner on terminal lines, use the `no exec-banner` command.
Defaults	**Enabled on all lines** (if configured, the banner appears).
Command Modes	LINE
Command History	**Version 9.3. (0.0)** Introduced on the M I/O Aggregator.
Usage Information	Optionally, use the `banner exec` command to create a text string that is displayed when you access EXEC mode. This command toggles that display.
Related Commands	banner exec— configures a banner to display when entering EXEC mode. line — enables and configures console and virtual terminal lines to the system.

ip radius source-interface

Specify an interface's IP address as the source IP address for RADIUS connections.

Syntax

`ip radius source-interface` *interface*

To delete a source interface, use the `no ip radius source-interface` command.

Parameters

interface	Enter the following keywords and slot/port or number information: • For a 100/1000 Ethernet interface, enter the keyword `GigabitEthernet` then the slot/port information. • For a Gigabit Ethernet interface, enter the keyword `GigabitEthernet` then the slot/port information. • For Loopback interfaces, enter the keyword `loopback` then a number from zero (0) to 16838. • For the Null interface, enter the keywords `null 0`. • For a Port Channel interface, enter the keywords `port-channel` then a number. The range is from 1 to 128. • For a ten-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` then the slot/port information. • For a 40-Gigabit Ethernet interface, enter the keyword `fortyGigE` then the slot/port information. • For VLAN interface, enter the keyword `vlan` then a number from 1 to 4094.

Defaults Not configured.

Command Modes CONFIGURATION

Command History

Version 9.3. (0.0)	Introduced on the M I/O Aggregator.

ip tacacs source-interface

Specify an interface's IP address as the source IP address for TACACS+ connections.

Syntax

`ip tacacs source-interface` *interface*

To delete a source interface, use the `no ip tacacs source-interface` command.

Parameters

interface	Enter the following keywords and slot/port or number information:

- For a 100/1000 Ethernet interface, enter the keyword `GigabitEthernet` then the slot/port information.
- For a Gigabit Ethernet interface, enter the keyword `GigabitEthernet` then the slot/port information.
- For Loopback interfaces, enter the keyword `loopback` then a number from zero (0) to 16838.
- For the Null interface, enter the keywords `null 0`.
- For a Port Channel interface, enter the keywords `port-channel` then a number. The range is from 1 to 128.
- For a ten-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` then the slot/port information.
- For a 40-Gigabit Ethernet interface, enter the keyword `fortyGigE` then the slot/port information.
- For VLAN interface, enter the keyword `vlan` then a number from 1 to 4094.

Defaults	Not configured.	
Command Modes	CONFIGURATION	
Command History	**Version 9.3. (0.0)**	Introduced on the M I/O Aggregator.

login authentication

To designate the terminal lines, apply an authentication method list.

Syntax

`login authentication {`*`method-list-name`* `| default}`

To use the local user/password database for login authentication, use the `no login authentication` command.

Parameters

method-list-name	Enter the keywords `method-list-name` to specify that method list, created in the `aaa authentication login` command, to be applied to the designated terminal line.
default	Enter the keyword `default` to specify that the default method list, created in the `aaa authentication login` command, is applied to the terminal line.

Defaults	No authentication is performed on the console lines. Local authentication is performed on the virtual terminal and auxiliary lines.
Command Modes	LINE

Command History	**Version 9.3(0.0)**	Introduced on the M I/O Aggregator.
Usage Information	If you configure the `aaa authentication login default` command, the `login authentication default` command automatically is applied to all terminal lines.	
Related Commands	aaa authentication login — selects the login authentication methods.	

RADIUS Commands

The following RADIUS commands are supported by Dell Networking Operating System (OS).

radius-server deadtime

Configure a time interval during which non-responsive RADIUS servers to authentication requests are skipped.

Syntax	`radius-server deadtime` *seconds* To disable this function or return to the default value, use the `no radius-server deadtime` command.	
Parameters	***seconds***	Enter a number of seconds during which non-responsive RADIUS servers are skipped. The range is from 0 to 2147483647 seconds. The default is **0 seconds**.
Defaults	**0 seconds**	
Command Modes	CONFIGURATION	
Command History	**Version 9.3. (0.0)**	Introduced on the M I/O Aggregator.

radius-server host

Configure a RADIUS server host.

Syntax	`radius-server host {`*hostname* `|` *ipv4-address* `|` *ipv6-address*`}`
	`[auth-port` *port-number*`] [retransmit` *retries*`] [timeout` *seconds*`]`
	`[key [`*encryption-type*`]` *key*`]`

Parameters

hostname	Enter the name of the RADIUS server host.
ipv4-address | *ipv6-address*	Enter the IPv4 address (A.B.C.D) or IPv6 address (X:X:X:X::X) of the RADIUS server host.
auth-port *port-number*	(OPTIONAL) Enter the keywords `auth-port` then a number as the port number. The range is from zero (0) to 65535. The default port-number is **1812**.
retransmit *retries*	(OPTIONAL) Enter the keyword `retransmit` then a number as the number of attempts. This parameter overwrites the `radius-server retransmit` command. The range is from zero (0) to 100. The default is **3 attempts**.
timeout *seconds*	(OPTIONAL) Enter the keyword `timeout` then the seconds the time interval the switch waits for a reply from the RADIUS server. This parameter overwrites the `radius-server timeout` command. The range is from 0 to 1000. The default is **5 seconds**.
key [*encryption-type*] *key*	(OPTIONAL) Enter the keyword `key` then an optional encryption-type and a string up to 42 characters long as the authentication key. The RADIUS host server uses this authentication key and the RADIUS daemon operating on this switch. For the encryption-type, enter either zero (`0`) or `7` as the encryption type for the key entered. The options are: • `0` is the default and means the password is not encrypted and stored as clear text. • `7` means that the password is encrypted and hidden. Configure this parameter last because leading spaces are ignored.

Defaults Not configured.

Command Modes CONFIGURATION

Command History

Version 9.3(0.0)	Introduced on the M I/O Aggregator.

Usage Information

To configure any number of RADIUS server hosts for each server host that is configured, use this command. Dell Networking Operating System (OS) searches for the RADIUS hosts in the order they are configured in the software.

The global default values for the `timeout`, `retransmit`, and `key` optional parameters are applied, unless those values are specified in the `radius-server host` or other commands. To return to the global default values, if you configure

the `timeout`, `retransmit`, or `key` values, include those keywords when using the `no radius-server host` command syntax.

Related Commands

login authentication — sets the database to be checked when a user logs in.

radius-server retransmit — sets the number of times the RADIUS server attempts to send information.

radius-server timeout — sets the time interval before the RADIUS server times out.

radius-server retransmit

Configure the number of times the switch attempts to connect with the configured RADIUS host server before declaring the RADIUS host server unreachable.

Syntax

`radius-server retransmit` *`retries`*

To configure zero retransmit attempts, use the `no radius-server retransmit` command.

To return to the default setting, use the `radius-server retransmit 3` command.

Parameters

retries	Enter a number of attempts that Dell Networking Operating System (OS) tries to locate a RADIUS server. The range is from zero (0) to 100. The default is **3 retries**.

Defaults **3 retries**

Command Modes CONFIGURATION

Command History

Version 9.3(0.0)	Introduced on the M I/O Aggregator.

Related Commands radius-server host — configures a RADIUS host.

radius-server timeout

To reply to a request, configure the amount of time the RADIUS client (the switch) waits for a RADIUS host server .

Syntax

`radius-server timeout` *`seconds`*

To return to the default value, use the `no radius-server timeout` command.

Parameters	*seconds*	Enter the number of seconds between an unsuccessful attempt and the radius-server timeout times out. The range is from zero (0) to 1000 seconds. The default is **5 seconds**.
Defaults	**5 seconds**	
Command Modes	CONFIGURATION	
Command History	**Version 9.3(0.0)**	Introduced on the M I/O Aggregator.
Related Commands	radius-server host — configures a RADIUS host.	

radius-server key

Configure a key for all RADIUS communications between the switch and the RADIUS host server.

Syntax

`radius-server key [`*`encryption-type`*`] `*`key`*

To delete a password, use the `no radius-server key` command.

Parameters

encryption-type	(OPTIONAL) Enter either zero (`0`) or `7` as the encryption type for the key entered. The options are: • `0` is the default and means the key is not encrypted and stored as clear text. • `7` means that the key is encrypted and hidden.
key	Enter a string that is the key to be exchanged between the switch and RADIUS servers. It can be up to 42 characters long.

Defaults	Not configured.	
Command Modes	CONFIGURATION	
Command History	**Version 9.3(0.0)**	Introduced on the M I/O Aggregator.

Usage Information

The key configured on the switch must match the key configured on the RADIUS server daemon.

If you configure the `key` parameter in the `radius-server host` command, the key configured with the `radius-server key` command is the default key for all RADIUS communications.

Related Commands	radius-server host — configures a RADIUS host.

show privilege

View your access level.

Syntax	`show privilege`
Command Modes	• EXEC • EXEC Privilege
Command History	**Version 9.3(0.0)** Introduced on the M I/O Aggregator.

Example	`Dell#show privilege`
	`Current privilege level is 15`
	`Dell#`

Suppressing AAA Accounting for Null Username Sessions

When you activate AAA accounting, the Dell Networking OS software issues accounting records for all users on the system, including users whose username string, because of protocol translation, is NULL. An example of this is a user who comes in on a line where the AAA authentication `login method-list none` command is applied. To prevent accounting records from being generated for sessions that do not have usernames associated with them, use the following command.

- Prevent accounting records from being generated for users whose username string is NULL.
  CONFIGURATION mode

  ```
  aaa accounting suppress null-username
  ```

TACACS+ Accounting

Enable AAA Accounting and create a record for monitoring the accounting function.

Syntax	`aaa accounting {system | exec | commands level} {name | default}{start-stop | wait-start | stop-only} {tacacs+}`
	To disable AAA Accounting, use the
	`no aaa accounting {system | exec | command level} {name | default}{start-stop | wait-start | stop-only} {tacacs+}`
	command

Defaults.

Parameters

system	*Enter the keyword system to send accounting information of any other AAA configuration.*
exec	*Enter the keyword exec to send accounting information when a user has logged in to EXEC mode.*
commands level	*Enter the keyword command then a privilege level for accounting of commands executed at that privilege level.*
name | default	*Enter one of the following:* • For name, enter a user-defined name of a list of accounting methods. • For default, the default accounting methods used.
start-stop	*Enter the keywords start-stop to send a "start accounting" notice at the beginning of the requested event and a "stop accounting" notice at the end of the event.*
wait-start	*Enter the keywords wait-start to ensure that the TACACS+ security server acknowledges the start notice before granting the user's process request.*
stop-only	*Enter the keywords stop-only to instruct the TACACS+ security server to send a "stop record accounting" notice at the end of the requested user process.*
tacacs+	Enter the keyword tacacs+ to use TACACS+ data for accounting.

Dell Networking OS currently only supports TACACS+ accounting.

Defaults None

Command Modes CONFIGURATION

Usage Information In the example above, TACACS+ accounting is used to track all usage of EXEC command and commands on privilege level 15. Privilege level 15 is the default. If you want to track usage at privilege level 1 for example, use the`aaa accounting command 1` command.

Command History

Version 9.5(0.0)	Supported on the M I/O aggregator.

Example

```
Dell(config)# aaa accounting exec default start-stop tacacs+
Dell(config)# aaa accounting command 15 default start-stop
tacacs+
Dell(config)#
```

Related Commands

enable password	changes the password for the enable command.

login authentication	enables AAA login authentication on the terminal lines.
password	creates a password.
tacacs-server host	specifies a TACACS+ server host.

TACACS+ Commands

Dell Networking OS supports TACACS+ as an alternate method for login authentication.

tacacs-server host

Specify a TACACS+ host.

Syntax

```
tacacs-server host {hostname | ipv4-address | ipv6-address}
[port number] [timeout seconds] [key key]
```

Parameters

hostname	Enter the name of the TACACS+ server host.
ipv4-address* | *ipv6-address	Enter the IPv4 address (A.B.C.D) or IPv6 address (X:X:X:X::X) of the TACACS+ server host.
port *number*	(OPTIONAL) Enter the keyword `port` then a number as the port to be used by the TACACS+ server. The range is from zero (0) to 65535. The default is **49**.
timeout *seconds*	(OPTIONAL) Enter the keyword `timeout` then the number of seconds the switch waits for a reply from the TACACS+ server. The range is from 0 to 1000. The default is **10 seconds**.
key *key*	(OPTIONAL) Enter the keyword `key` then a string up to 42 characters long as the authentication key. This authentication key must match the key specified in the `tacacs-server key` for the TACACS+ daemon.

Defaults Not configured.

Command Modes CONFIGURATION

Command History

Version 9.3(0.0)	Introduced on the M I/O Aggregator.

Usage Information	To list multiple TACACS+ servers to be used by the `aaa authentication login` command, configure this command multiple times. If you are not configuring the switch as a TACACS+ server, you do not need to configure the `port`, `timeout` and `key` optional parameters. If you do not configure a key, the key assigned in the `tacacs-server key` command is used.
Related Commands	aaa authentication login — specifies the login authentication method. tacacs-server key — configures a TACACS+ key for the TACACS server.

tacacs-server key

Configure a key for communication between a TACACS+ server and a client.

Syntax	`tacacs-server key [`*`encryption-type`*`] key` To delete a key, use the `no tacacs-server key` *`key`* command.	
Parameters	***encryption-type***	(OPTIONAL) Enter either zero (`0`) or `7` as the encryption type for the key entered. The options are: • `0` is the default and means the key is not encrypted and stored as clear text. • `7` means that the key is encrypted and hidden.
	key	Enter a text string, up to 42 characters long, as the clear text password. Leading spaces are ignored.
Defaults	Not configured.	
Command Modes	CONFIGURATION	
Command History	**Version 9.3. (0.0)**	Introduced on the M I/O Aggregator.
Usage Information	The key configured with this command must match the key configured on the TACACS+ daemon.	

timeout login response

Specify how long the software waits for the login input (for example, the user name and password) before timing out.

Syntax

`timeout login response` *seconds*

To return to the default values, use the `no timeout login response` command.

Parameters

seconds	Enter a number of seconds the software waits before logging you out. The range is: • VTY: the range is from 1 to 30 seconds, the default is **30 seconds**. • Console: the range is from 1 to 300 seconds, the default is **0 seconds** (no timeout). • AUX: the range is from 1 to 300 seconds, the default is **0 seconds** (no timeout).

Defaults

See the defaults settings shown in *Parameters*.

Command Modes

LINE

Command History

Version 9.3.0.0	Introduced on the M I/O Aggregator.

Usage Information

The software measures the period of inactivity defined in this command as the period between consecutive keystrokes. For example, if your password is "password" you can enter "p" and wait 29 seconds to enter the next letter.

SSH Server and SCP Commands

The Dell Networking OS supports secure shell (SSH) protocol versions 1.5 and 2.0. SSH is a protocol for secure remote login over an insecure network. SSH sessions are encrypted and use authentication. The SSH and SCP commands are:

- show ip ssh
- show ip ssh client-pub-keys
- show ip ssh rsa-authentication
- ssh

enable password

Change the password for the `enable` command.

Syntax

`enable password [level level] [encryption-type] password`

To delete a password, use the `no enable password [encryption-type] password [level level]` command.

Parameters

level *level*	(OPTIONAL) Enter the keyword `level` followed by a number as the level of access. The range is from 1 to 15.
encryption-type	(OPTIONAL) Enter the number `7` or `0` as the encryption type. Enter a `7` followed by a text string as the hidden password. The text string must be a password that was already encrypted by a Dell Networking router. Use this parameter only with a password that you copied from the `show running-config` file of another Dell Networking router.
password	Enter a text string, up to 32 characters long, as the clear text password.

Defaults

No password is configured. *level* = **15**.

Command Modes

CONFIGURATION

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

Use this command to define a password for a level.

Passwords must meet the following criteria:

- Start with a letter, not a number.
- Passwords can have a regular expression as the password. To create a password with a regular expression in it, use CNTL + v prior to entering regular expression. For example, to create the password `abcd]e`, you type "`abcd CNTL v ]e`". When the password is created, you do not use the CNTL + v key combination and enter "`abcd]e`".

NOTE: The question mark (?) and the tilde (~) are not supported characters.

Related Commands

show running-config— views the current configuration.

enable restricted

Allows Dell Networking technical support to access restricted commands.

Syntax

`enable restricted [encryption-type] password`

To disallow access to restricted commands, use the `no enable restricted` command.

Parameters

encryption-type	(OPTIONAL) Enter the number `7` as the encryption type. Enter `7` followed a text string as the hidden password. The text string must be a password that was already encrypted by a Dell Networking router. Use this parameter only with a password that you copied from the `show running-config` file of another Dell Networking router.
password	Enter a text string, up to 32 characters long, as the clear text password.

Command Modes

Not configured.

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

Only Dell Networking Technical Support staff use this command.

enable ioa-debug

Enable IOA debug-level commands.

NOTE: This command has been deprecated in Dell Networking OS version 9.2(0.0).

Syntax

`enable ioa-debug`

To disable SMUX debug, use `no enable ioa-debug` command.

Command Modes

Not configured.

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.
Version 9.2(0.0)	Deprecated command

service password-encryption

Encrypt all passwords configured in Dell Networking OS.

Syntax

```
service password-encryption
```

To store new passwords as clear text, use the `no service password-encryption` command.

Defaults

Enabled.

Command Modes

CONFIGURATION

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

CAUTION: Encrypting passwords with this command does not provide a high level of security. When the passwords are encrypted, you cannot return them to plain text unless you re-configure them. To remove an encrypted password, use the `no password password` command.

To keep unauthorized people from viewing passwords in the switch configuration file, use the `service password-encryption` command. This command encrypts the clear-text passwords created for user name passwords, authentication key passwords, the privileged command password, and console and virtual terminal line access passwords.

To view passwords, use the `show running-config` command.

show ip ssh

Display information about established SSH sessions.

Syntax

```
show ip ssh
```

Command Modes

- EXEC
- EXEC Privilege

Example

```
Dell#show ip ssh
2#show ip ssh
SSH server                  : disabled.
SSH server version          : v1 and v2.
Password Authentication     : enabled.
Hostbased Authentication    : disabled.
RSA Authentication          : disabled.
Dell#
```

Related Commands

show ip ssh client-pub-keys— displays the client-public keys.

show ip ssh client-pub-keys

Displays the client public keys used in host-based authentication

Syntax

```
show ip ssh client-pub-keys
```

Defaults

none

Command Modes

EXEC

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

This command displays the contents of the `flash://ADMIN_DIRssh/knownhosts` file.

Example

```
Dell#show ip ssh client-pub-keys

poclab4,123.12.1.123 ssh-rsa AAAAB3NzaC1yc2EAAAABIwAAAIEAox/
QQp8xYhzOxn07yh4VGPAoUfgKoieTHO9G4sNV+ui
+DWEc3cgYAcU5Lai1MU2ODrzhCwyDNp05tKBU3tReG1
o8AxLi6+S4hyEMqHzkzBFNVqHzpQc
+Rs4p2urzV0F4pRKnaXdHf3Lk4D460HZRhhVrxqeNxPDpEnWIMPJi0
ds= ashwani@poclab4

Dell#
```

show ip ssh rsa-authentication

Displays the authorized-keys for the RSA authentication.

Syntax

```
show ip ssh rsa-authentication {my-authorized-keys}
```

Parameters

my-authorized-keys	Display the RSA authorized keys.

Defaults

none

Command Modes

EXEC

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

This command displays the contents of the `flash:/ADMIN_DIR/ssh/authorized-keys.username` file.

Example

```
Dell#show ip ssh rsa-authentication my-authorized-keys
ssh-rsa
AAAAB3NzaC1yc2EAAAABIwAAAIEAyB17l4gFp4r2DRHIvMc1VZd0Sg5GQxRV1y1
X1JOMeO6Nd0WuYyzrQMM
4qJAoBwtneOXfLBcHF3V2hcMIqaZN+CRCnw/
zCMlnCf0+qVTd1oofsea5r09kS0xTp0CNfHXZ3NuGCq9Ov33m9+U9tMwhS8vy8A
```

```
VxdH4x4km3c3t5Jvc=
freedom@poclab4
Dell#
```

show users

Allows you to view information on all users logged in to the switch.

Syntax `show users [all]`

Parameters

all	(OPTIONAL) Enter the keyword `all` to view all terminal lines in the switch.

Command Modes EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information The following describes the `show user` command shown in the following example.

Field	Description
(untitled)	Indicates with an asterisk (*) which terminal line you are using.
Line	Displays the terminal lines currently in use.
User	Displays the user name of all users logged in.
Host(s)	Displays the terminal line status.
Location	Displays the IP address of the user.

Example

```
Dell#show user
Line         User               Host(s)               Location
0 console 0  admin              idle
* 3 vty   1  admin              idle
172.31.1.4
Dell#
```

Related Commands ssh— enables a user.

ssh

Open an SSH connection specifying the host name, username, port number and version of the SSH client.

Dell Networking OS supports both inbound and outbound SSH sessions using IPv4 addressing. Inbound SSH supports accessing the system through the management interface as well as through a physical Layer 3 interface.

Syntax

```
ssh {hostname | ipv4 address} [-| username | -p port-number|-v {1|2}]
```

Parameters

hostname	(OPTIONAL) Enter the IP address or the host name of the remote device.
ipv4 address	(OPTIONAL) Enter the IP address in dotted decimal format A.B.C.D.
-l *username*	(OPTIONAL) Enter the keyword `-l` followed by the user name used in this SSH session. The default is the user name of the user associated with the terminal.
-p *port-number*	(OPTIONAL) Enter the keyword `-p` followed by the port number. The range is from 1 to 65536. The default is **22**.
-v {1 | 2}	(OPTIONAL) Enter the keyword `-v` then the SSH version 1 or 2. The default is the version from the protocol negotiation.

Defaults As shown in the *Parameters* section.

Command Modes EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Example

```
Dell#ssh 123.12.1.123 -l ashwani -p 5005 -v 2
```

username

Establish an authentication system based on user names.

Syntax

```
username name access-list-name [nopassword | {password | secret} [encryption-type] password] [privilege level]
```

If you do not want a specific user to enter a password, use the `nopassword` option.

To delete authentication for a user, use the `no username name` command.

Parameters

name	Enter a text string for the name of the user up to 63 characters.
access-list-name	Enter the name of a configured access control list (either an IP access control list or MAC access control list).
nopassword	Enter the keyword `nopassword` to specify that the user should not enter a password.
password	Enter the keyword `password` followed by the `encryption-type` or the password.
secret	Enter the keyword `secret` followed by the `encryption-type` or the password.
encryption-type	Enter an encryption type for the `password` that you enter. • `0` directs Dell Networking OS to store the password as clear text. It is the default encryption type when using the `password` option. • `7` to indicate that a password encrypted using a DES hashing algorithm follows. This encryption type is available with the `password` option only. • `5` to indicate that a password encrypted using an MD5 hashing algorithm follow. This encryption type is available with the `secret` option only, and is the default encryption type for this option.
password	Enter a string up to 32 characters long.
privilege *level*	Enter the keyword `privilege` then a number from zero (0) to 15.
secret	Enter the keyword `secret` then the encryption type.

Defaults

The default encryption type for the `password` option is **0**. The default encryption type for the `secret` option is **0**.

Command Modes

CONFIGURATION

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

To view the defined user names, use the `show running-config user` command.

Related Commands

service password-encryption— specifies a password for users on terminal lines.

show running-config— views the current configuration.

21

Simple Network Management Protocol (SNMP) and Syslog

This chapter contains commands to configure and monitor the simple network management protocol (SNMP) v1/v2 and Syslog.

The chapter contains the following sections:

- SNMP Commands
- Syslog Commands

SNMP Commands

The SNMP commands available in the Dell Networking OS are:

- snmp-server enable traps
- snmp-server host

The simple network management protocol (SNMP) is used to communicate management information between the network management stations and the agents in the network elements. Dell Networking OS supports SNMP versions 1, and 2c supporting only read-only mode.

Important Points to Remember

- Typically, 5-second timeout and 3-second retry values on an SNMP server are sufficient for both local area network (LAN) and wide area network (WAN) applications. If you experience a timeout with these values, the recommended best practice on Dell Networking switches (to accommodate their high port density) is to increase the timeout and retry values on your SNMP server to the following:
  - SNMP Timeout — greater than 3 seconds.
  - SNMP Retry count — greater than 2 seconds.
- SNMP operations are not supported on a virtual local area network (VLAN).

Syslog Commands

The following commands allow you to configure logging functions on all Dell Networking switches.

- clear logging
- logging buffered
- logging console
- logging hostname

- logging monitor
- logging source-interface
- logging trap
- show logging
- terminal monitor

clear logging

Clear the messages in the logging buffer.

Syntax	`clear logging`
Defaults	none
Command Modes	EXEC Privilege
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.
Related Commands	show logging— displays logging settings and system messages in the internal buffer.

logging buffered

Enable logging and specify which messages are logged to an internal buffer. By default, all messages are logged to the internal buffer.

Syntax

`logging buffered [level] [size]`

To return to the default values, use the `no logging buffered` command.

To disable logging stored to an internal buffer, use the `no logging buffered` command.

Parameters

level	(OPTIONAL) Indicate a value from 0 to 7 or enter one of the following equivalent words: `emergencies`, `alerts`, `critical`, `errors`, `warnings`, `notifications`, `informational`, or `debugging`. The default is **7** or **debugging**.
size	(OPTIONAL) Indicate the size, in bytes, of the logging buffer. The number of messages buffered depends on the size of each message. The range is from 40960 to 524288. The default is **40960 bytes**.

Defaults

level = 7; *size* = 40960 bytes

Command Modes	CONFIGURATION
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.
Usage Information	When you decrease the buffer size, all messages stored in the buffer are lost. Increasing the buffer size does not affect messages stored in the buffer.
Related Commands	clear logging— clears the logging buffer. logging hostname— returns the logging buffered parameters to the default setting. show logging— displays the logging setting and system messages in the internal buffer.

logging console

Specify which messages are logged to the console.

Syntax	`logging console [level]` To return to the default values, use the `logging hostname` command. To disable logging to the console, use the `no logging console` command.
Parameters	***level*** (OPTIONAL) Indicate a value from 0 to 7 or enter one of the following parameters: `emergencies`, `alerts`, `critical`, `errors`, `warnings`, `notifications`, `informational`, or `debugging`. The default is **7** or **debugging**.
Defaults	level = **7**; size = **debugging**
Command Modes	CONFIGURATION
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.
Related Commands	clear logging— clears the logging buffer. logging hostname— returns the logging console parameters to the default setting. show logging—displays the logging setting and system messages in the internal buffer.

logging hostname

Configure an IP address or host name of a Syslog server where logging messages are sent. Multiple logging servers of both IPv4 and/or IPv6 can be configured.

Syntax

`logging {ipv4-address | hostname}`

To disable logging, use the `no logging` command.

Parameters

ipv4-address	Enter the IPv4 address (A.B.C.D).
hostname	Enter the name of a host already configured and recognized by the switch.

Defaults

Disabled.

Command Modes

CONFIGURATION

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Related Commands

logging trap— enables logging to the Syslog server based on severity.

logging monitor

Specify which messages are logged to Telnet applications.

Syntax

`logging monitor [level]`

To disable logging to terminal connections, use the `no logging monitor` command.

Parameters

level	Indicate a value from 0 to 7 or enter one of the following parameters: `emergencies`, `alerts`, `critical`, `errors`, `warnings`, `notifications`, `informational`, or `debugging`. The default is **7** or **debugging**.

Defaults

7 or **debugging**

Command Modes

CONFIGURATION

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Related Commands

logging hostname— returns the logging monitor parameters to the default setting.

logging source-interface

Specify that the IP address of an interface is the source IP address of Syslog packets sent to the Syslog server.

Syntax

`logging source-interface` *interface*

To disable this command and return to the default setting, use the `no logging source-interface` command.

Parameters

interface	Enter the following keywords and slot/port or number information: • For a Ten-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information. • For VLAN interface, enter the keyword `vlan` followed by a number from 1 to 4094.

Defaults

Not configured.

Command Modes

CONFIGURATION

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator

Usage Information

Syslog messages contain the IP address of the interface used to egress the router. By configuring the `logging source-interface` command, the Syslog packets contain the IP address of the interface configured.

Related Commands

logging hostname— enables logging to the Syslog server.

logging trap

Specify which messages are logged to the Syslog server based the message severity.

Syntax

`logging trap [`*level*`]`

To return to the default values, use the `default logging trap` command.

To disable logging, use the `no logging trap` command.

Parameters

level	Indicate a value from 0 to 7 or enter one of the following parameters: `emergencies`, `alerts`, `critical`, `errors`, `warnings`, `notifications`, `informational`, or `debugging`. The default is **6** or **informational**.

Defaults	**6** or **informational**	
Command Modes	CONFIGURATION	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.
Related Commands	logging hostname— enables the logging to another device.	

show logging

Displays the logging settings and system messages logged to the internal buffer of the switch.

Syntax

```
show logging [number | history [reverse][number] | reverse
[number] | summary | | driverlog[stack-unit number] | kernellog
[stack-unit number]]
```

Parameters

number	(OPTIONAL) Enter the number of messages displayed in the output. The range is from 1 to 65535.
history	(OPTIONAL) Enter the keyword `history` to view only information in the Syslog history table.
reverse	(OPTIONAL) Enter the keyword `reverse` to view the Syslog messages in FIFO (first in, first out) order.
summary	(OPTIONAL) Enter the keyword `summary` to view a table showing the number of messages per type and per slot.
driverlog	(OPTIONAL) Enter the keyword`driverlog` to view the driverlog information per stack-unit. Enter the keyword stack-unit followed by the stack member ID of the switch for which you want to display the driver log. The range is from 0 to 1.
kernellog	(OPTIONAL) Enter the keyword `kernellog`to view the kernellog information per stack-unit. Enter the keyword stack-unit followed by the stack member ID of the switch for which you want to display the driver log. The range is from 0 to 1.

Command Modes

- EXEC
- EXEC Privilege

Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

Example (Partial)

```
Dell#show logging
Syslog logging: enabled
  Console logging: level debugging
  Monitor logging: level debugging
  Buffer logging: level debugging, 168 Messages Logged, Size
(40960
bytes)
 Trap logging: level informational
       Logging to 172.16.1.162
       Logging to 10.10.10.4
       Logging to 10.1.2.4
       Logging to 172.31.1.4
       Logging to 133.33.33.4
Aug 1 15:05:53: %STKUNIT1-M:CP %SYS-5-CONFIG_I: Configured
from console
Jul 31 20:25:40: %STKUNIT1-M:CP %SYS-5-CONFIG_I: Configured
from
console
Jul 31 20:14:03: %STKUNIT1-M:CP %SYS-5-CONFIG_I: Configured
from
console
Jul 31 20:03:58: %STKUNIT1-M:CP %SYS-5-CONFIG_I: Configured
from
console
Jul 31 18:22:10: %STKUNIT1-M:CP %SYS-5-CONFIG_I: Configured
from
console
Jul 31 15:50:30: %STKUNIT1-M:CP %SYS-5-CONFIG_I: Configured
from
console
Jul 31 14:26:22: %STKUNIT1-M:CP %SYS-5-CONFIG_I: Configured
from
console
Jul 31 14:26:17: %STKUNIT1-M:CP %SEC-3-
AUTHENTICATION_ENABLE_SUCCESS:
Enable pas
sword authentication success on console
Jul 31 14:26:17: %STKUNIT1-M:CP %SEC-4-
ENABLE_PASSW_NOT_CONFIGURED:
Enable passw
ord is required for authentication but not configured
Jul 31 10:38:12: %STKUNIT1-M:CP %SYSADM-5-CPU_THRESHOLD_CLR:
Overall cpu
usage o
f management-unit drops below threshold. Cpu1minUsage (65%)
--More--
```

Example (History)

```
Dell#show logging history
Syslog History Table: 1 maximum table entries,
saving level warnings or higher
  SNMP notifications not Enabled
May 22 08:53:09: %STKUNIT0-M:CP %SEC-3-
AUTHENTICATION_ENABLE_SUCCESS: Enable
password authentication success on vty0 ( 10.11.68.22 )
Dell#
```

Example (Driverlog)

```
Dell#show logging driverlog stack-unit 1
0:Task(tUsrRoot): [ 45232]SS DRV DEBUG: Wrapper init complete
1:Task(tUsrRoot): [ 206775]SS DRV DEBUG: Core init complete
2:Task(tUsrRoot): [ 221545]SS DRV DEBUG: SMUX-DRV: BASE MODUEL
in
```

```
Fanout ENABLED
3:Task(tUsrRoot): [ 24038]SS DRV DEBUG: port:32 isfanout:1
4:Task(tUsrRoot): [ 27]SS DRV DEBUG: port:36 isfanout:1
5:Task(tUsrRoot): [ 19]SS DRV DEBUG: port:40 isfanout:0
6:Task(tUsrRoot): [ 17]SS DRV DEBUG: port:44 isfanout:0
7:Task(tUsrRoot): [ 22]SS DRV DEBUG: port:48 isfanout:1
8:Task(tUsrRoot): [ 22]SS DRV DEBUG: port:52 isfanout:1
9:Task(tUsrRoot): [ 33]SS DRV DEBUG: Appl init complete
10:Task(tUsrRoot): [ 2590]SS DRV DEBUG: Util Init complete
11:Task(tUsrRoot): [ 21]SS DRV DEBUG: Device Entry Get Complete
12:Task(tUsrRoot): [ 25]SS DRV DEBUG: Sysconf init complete
13:Task(tUsrRoot): [ 19]SS DRV DEBUG: Initializing default soc/
sal
configs
14:Task(tUsrRoot): [ 237]SS DRV DEBUG: sysconf probe complete
15:Task(tUsrRoot): [ 118]SS DRV DEBUG: Updating based on Optm
16:Task(tUsrRoot): [ 10351]SS DRV DEBUG: Updating based on
Fanout
17:Task(tUsrRoot): [ 2561]SS DRV DEBUG: unit 0 localWc6 speed10
18:Task(tUsrRoot): [ 24]SS DRV DEBUG: unit 0 localWc5 speed10
19:Task(tUsrRoot): [ 21]SS DRV DEBUG: unit 0 localWc3 speed40
20:Task(tUsrRoot): [ 18]SS DRV DEBUG: unit 0 localWc2 speed40
```

terminal monitor

Configure the Dell Networking OS to display messages on the monitor/terminal.

Syntax

`terminal monitor`

To return to default settings, use the `terminal no monitor` command.

defaults

Disabled.

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Related Commands

logging monitor— sets the logging parameters on the monitor/terminal.

22

Stacking Commands

Stacking is supported on an Aggregator only on the 40GbE ports on the base module. Stacking is limited to two Aggregators in the same chassis in a single stack. Up to three stacks are supported in an M1000e chassis.

Stacking provides a single point of management and NIC teaming for high availability and higher throughput. To configure an Aggregator stack, you must use the CLI.

The stacking commands are always available and operational, whether or not an Aggregator has a stacking module inserted. You can use the commands to pre-configure an Aggregator, so that the configuration settings are invoked when the Aggregator is attached to other Aggregator blades.

For more information about using the Aggregator stacking feature, refer to the *Stacking Aggregators* chapter in the Dell Networking OS Configuration Guide for the M I/O Aggregator.

You can use the following commands to manage a stack of Aggregator I/O modules:

- power-cycle stack-unit
- reset stack-unit
- show system stack-ports
- show system stack-unit fanout
- show system stack-unit iom-mode
- show system stack-unit stack-group
- stack-unit iom-mode

power-cycle stack-unit

To hard reset any stack unit including master unit.

Syntax	`power-cycle stack-unit [0-5 | all]`
Defaults	None
Command Modes	EXEC Privilege
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.
Usage Information	This command is used to reset the stack-unit. The master unit can also be power cycled using this command.

reset stack-unit

Reset any designated stack member except the management unit (master unit).

Syntax `reset stack-unit 0–5 hard`

Parameters

0–5	Enter the stack member unit identifier of the stack member to reset.
hard	Reset the stack unit if the unit is in a problem state.

Defaults none

Command Modes EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information Resetting the management unit is not allowed and an error message displays if you try to do so. Resetting is a soft reboot, including flushing the forwarding tables.

You can run this command directly on the stack standby unit (Standby Master) to reset the standby. You cannot reset any other unit from the standby unit

Example

```
Dell#show system brief
Stack MAC : 00:1e:c9:f1:00:9b
-- Stack Info --
Unit    UnitType      Status      ReqTyp        CurTyp
Version      Ports
-----------------------------------------------------------------
------------------
---
0       Management     online    I/O-Aggregator I/O-
Aggregator    8-3-17-46   56
1       Standby        online    I/O-Aggregator I/O-
Aggregator    8-3-17-46   56
2       Member      not present
3       Member      not present
4       Member      not present
5       Member      not present
Dell#
Dell#reset stack-unit 0 >>>Resetting master not allowed
% Error: Reset of master unit is not allowed.
Dell#
Dell#reset stack-unit 1
Dell#01:02:00: %STKUNIT0-M:CP %CHMGR-5-STACKUNIT_RESET: Stack
unit 1 being reset
01:02:00: %STKUNIT0-M:CP %IFMGR-1-DEL_PORT: Removed port: Te
1/1-32,41-56
01:02:00: %STKUNIT0-M:CP %CHMGR-2-STACKUNIT_DOWN: Stack unit 1
down - reset
01:02:00: %STKUNIT1-S:CP %IFMGR-1-DEL_PORT: Removed port: Te
1/1-32,41-56
01:02:05: %I/O-Aggregator:0 %IFAGT-5-STACK_PORT_LINK_DOWN:
Changed stack port
state to down: 0/37
01:02:11: %STKUNIT0-M:CP %POLLMGR-2-ALT_STACK_UNIT_STATE:
Alternate Stack-unit is
```

```
not present
Dell#01:02:12: %STKUNIT0-M:CP %CHMGR-2-STACKUNIT_DOWN: Stack
unit 1 down - card
removed
```

Related Commands

reload— reboots the system.

power-cycle stack-unit— resets the designated stack member.

show system stack-ports

Display information about the stacking ports on all switches in the M I/O Aggregator switch stack..

Syntax

```
show system stack-ports [status | topology]
```

Parameters

status	(OPTIONAL) Enter the keyword `status` to display the command output without the Connection field.
topology	(OPTIONAL) Enter the keyword `topology` to limit the table to just the Interface and Connection fields.

Defaults

none

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

The following describes the `show interfaces` command shown in the following example.

Field	Description
Topology	Lists the topology of stack ports connected: Ring, Daisy chain, or Standalone.
Interface	The unit/port ID of the connected stack port on this unit.
Link Speed	Link Speed of the stack port (10 or 40) in Gb/s.
Admin Status	The only currently listed status is Up.
Connection	The stack port ID to which this unit's stack port is connected.

Example

```
Dell# show system stack-ports
Topology: Ring

Interface Connection Link Speed    Admin  Link   Trunk
                     (Gb/s)        Status Status Group
0/33                  40             up    down
```

```
0/37          1/37      40              up      up
1/33                    40              up      down
1/37          0/37      40              up      up
Dell#
```

Example (Status)

```
Dell# show system stack-ports status
Topology: Daisy chain
Interface Link Speed   Admin   Link    Trunk
          (Gb/s)       Status  Status  Group
0/33        40           up    down
0/37        40           up     up
1/33        40           up    down
1/37        40           up     up
```

Example (Topology)

```
Dell# show system stack-ports topology
Topology: Daisy chain

Interface Connection Trunk
                     Group

0/33
0/37       1/37
1/33
1/37       0/37
Dell    #
```

Related Commands

power-cycle stack-unit—resets the designated stack member.

show diag— displays the data plane or management plane input and output statistics of the designated component of the designated stack member.

show system—displays the current status of all stack members or a specific member.

show system stack-unit fanout

Displays the current 40GbE ports configured in fanout mode.

Syntax

```
show system stack-unit <unit-number> fanout[configured]
```

Parameters

unit-number <0–5>	Enter the number of the member stack unit. The range is from 0 to 5.

Defaults

none

Command Modes

- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Example

```
Dell#show system stack-unit 0 fanout ?
configured Configured fan out ports
Dell#show system stack-unit 0 fanout configured ?
| Pipe through a command
<cr>
Dell#show system stack-unit 0 fanout configured
Configured fan out ports in stack-unit 0
Configured Next Boot
33          33
37          37
41          41
45          45
Dell#
```

show system stack-unit iom-mode

Displays the current iom-mode (stack/standalone) and the mode configured after next reboot.

Syntax `show system stack-unit unit-number iom-mode`

Parameters

unit number <0–5>	Enter the number of the member stack unit. The range is from 0 to 5.

Command Modes EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Example

```
Dell#show system stack-unit all iom-mode ?
|                  Pipe through a command
<cr>
Dell#show system stack-unit all iom-mode
Unit       Boot-Mode             Next-Boot
-----------------------------------------------
0           stack                 stack
1           stack                 stack
2           stack                 stack
3           stack                 stack
4       Not Present
5       Not Present
Dell#
```

show system stack-unit iom-uplink-speed

Display the uplink speed of the LAG bundles configured on the Flex IO modules installed on the Aggregator.

Syntax `show system stack-unit unit-number iom-uplink-speed`

Parameters	***unit number <0-5>***	Enter the number of the member stack unit. The range is from 0 to 5.
Command Modes	EXEC Privilege	
Command History	**Version 9.3.0.0**	Introduced on the M I/O Aggregator

Usage Information The value under the Boot-speed field in the output of the show command indicates the uplink speed that is currently effective on the LAG bundles, whereas the value under the Next-Boot field indicates the uplink speed that is applicable for the LAG bundle after the next reboot of the switch.

Example

```
Dell# show system stack-unit 0 iom-uplink-speed
Unit    Boot-speed                      Next-Boot
-----------------------------------------------
0         10G                               40G
```

show system stack-unit stack-group

Displays the stack-groups present/configured for a M I/O Aggregator stack unit.

Syntax `show system stack-unit unit-number stack-group [configured]`

Parameters	***unit number <0–5>***	Enter the number of the member stack unit. The range is from 0 to 5.
Defaults	none	
Command Modes	EXEC Privilege	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

Example

```
Dell#show system stack-unit 0 stack-group ?
configured        Configured stack groups
|                 Pipe through a command
<cr>
Dell#show system stack-unit 0 stack-group configured
Configured stack groups in stack-unit 0
Dell#show system stack-unit 0 stack-group
Stack group Ports
-----------------------------------
0            0/33
1            0/37
2            0/41
3            0/45
Dell#
```

Related Commands

reload— reboots the system.

show system— displays the current status of all stack members or a specific member.

stack-unit iom-mode

Toggle the M I/O Aggregator operating mode between programmable multiplex, stand-alone, stack, and VLT modes.

Syntax

```
stack-unit <unit-number> iom-mode [programmable-mux | stack |
standalone | vlt]
```

Parameters

unit number ***<0-5>***	Enter the number of the member stack unit. The range is from 0 to 5.
programmable -mux	Enable programmable multiplex mode.
stack	Enable stack mode.
standalone	Enable stand-alone mode.
vlt	Enable virtual link trunking mode.

Defaults

standalone

Command Modes

- CONFIGURATION

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Example

```
Dell(conf)#stack-unit 0 iom-mode stack
% You are about to stack your IOA module, please reload the IOA
and then plug in the stacking cable for the changes to take
effect.
Dell(conf)#
Dell#
```

Related Commands

reload— Reboots the operating system.

show system— displays the current status of all stack members or a specific member.

stack-unit iom-mode uplink-speed

Specify the uplink speed of the member interfaces in a LAG bundle for the Aggregator that operates in standalone, stacking, or VLT mode to be 40 GbE. By default, the uplink speed of the LAG bundle is set as 10 GbE.

Syntax

`stack-unit` *`unit-number`* `iom-mode {stack | standalone | vlt} uplink-speed 40G`

To restore the default uplink speed of the LAG bundle, which is 10 GbE, use the `stack-unit` *`unit-number`* `iom-mode {stack | standalone | vlt}` command.

Parameters

unit number <0-5>	Enter the number of the member stack unit. The range is from 0 to 5.
iom-mode	Denotes the operating mode of the I/O Aggregator.
stack	Specify that the uplink speed of the member interfaces in a LAG bundle applies for the Aggregator in stacking mode
standalone	Specify that the uplink speed of the member interfaces in a LAG bundle applies for the Aggregator in standalone mode
vlt	Specify that the uplink speed of the member interfaces in a LAG bundle applies for the Aggregator in VLT mode
uplink-speed 40G	Set the uplink speed of the member or child interfaces of the LAG bundle to function at 40 Gigabit Ethernet per second

Command Modes

CONFIGURATION

Command History

Version 9.3.0.0	Introduced on the M I/O Aggregator

Usage Information

This functionality to set the uplink speed is available from the CMC interface when the I/O Aggregator functions as a simple MUX or a VLT node with all of the uplink interfaces configured to be member links in the same LAG bundle. You cannot configure the uplink speed to be set as 40 GbE by default if the Aggregator functions in programmable MUX mode with mutiple uplink LAG interfaces or in stacking mode because CMC is not involved with configuration of parameters when the Aggregator operates in either of these modes with uplink interfaces being part of different LAG bundles.

When you configure the native mode to be 40 GbE, the CMC sends a notification to the IOA to set the default internal working of all of the ports to be 40 GbE after the reload of the switch is performed. After you configure the native mode that denotes the uplink speed of the module ports to be 40 GbE, you must enter the `reboot` command (not pressing the Reset button, which causes the factory default settings to be applied when the device comes up online) from the CMC to cause the configuration of the uplink speed to be effective.

stack-unit priority

Configure the ability of a switch to become the management unit of a stack.

Syntax

```
stack-unit stack-number priority 1-14
```

Parameters

stack-number	Enter the stack member unit identifier.
1–14	This preference parameter allows you to specify the management priority of one backup switch over another, with 0 the lowest priority and 14 the highest. The switch with the highest priority value is chosen to become the management unit if the active management unit fails or on the next reload.

Defaults

0

Command Modes

CONFIGURATION

Command History

Version 9.3(0.0)	Introduced on the M I/O Aggregator.

Related Commands

- reload – reboots Dell Networking Operating System (OS).
- show system – displays the status of all stack members or a specific member.

stack-unit renumber

Change the stack member ID of any stack member or a stand-alone unit.

Syntax

```
stack-unit 0-5 renumber 0-5
```

Parameters

0-5	The first instance of this value is the stack member unit identifier, from 0 to 5, of the switch that you want add to the stack. The range is from 0 to 5. The second instance of this value is the desired new unit identifier number.

Defaults

none

Command Modes

EXEC Privilege

Command History

Version 9.3(0.0)	Introduced on the M I/O Aggregator

Usage Information

You can renumber any switch, including the management unit or a stand-alone unit.

You cannot renumber a unit to a number of an active member in the stack.

When executing this command on the master, the stack reloads. When the members are renumbered, only that specific unit is reset and comes up with the new unit number.

Example

```
Dell#stack-unit 5 renumber 4

Renumbering will reset the unit.
Warning: Interface configuration for current unit will be lost!
Proceed to renumber [confirm yes/no]:
```

Related Commands

- reload – reboots Dell Networking Operating System (OS).
- reset stack-unit – resets the designated S-Series stack member.
- show system – displays the current status of all stack members or a specific member.

23

System Time

The commands in this chapter configure time values on the system, either using the Dell Networking OS, the hardware, or using the network time protocol (NTP). With NTP, the switch can act only as a client to an NTP clock host.

For more information, refer to the **Network Time Protocol** section of the *Management* chapter in the *Dell PowerEdge M I/O Aggregator Configuration Guide*.

The NTP commands are:

- calendar set
- ntp server
- show calendar
- show clock
- clock read-calendar
- clock set
- clock summer-time date
- clock summer-time recurring
- clock timezone
- clock update-calendar

calendar set

Set the time and date for the switch hardware clock.

Syntax `calendar set time month day year`

Parameters

time	Enter the time in hours:minutes:seconds. For the hour variable, use the 24-hour format; for example, 17:15:00 is 5:15 pm.
month	Enter the name of one of the 12 months in English. You can enter the name of a day to change the order of the display to time day month year.
day	Enter the number of the day. The range is from 1 to 31. You can enter the name of a month to change the order of the display to *time day month year*.
year	Enter a four-digit number as the year. The range is from 1993 to 2035.

Command Modes	EXEC Privilege
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.
Usage Information	You can change the order of the month and day parameters to enter the time and date as time day month year. In the switch, the hardware clock is separate from the software and is called the calendar. This hardware clock runs continuously. After the hardware clock (the calendar) is set, the operating system automatically updates the software clock after system bootup. You cannot delete the hardware clock (calendar). To manually update the software with the hardware clock, use the `clock read-calendar` command.
Example	`Dell#calendar set 08:55:00 june 18 2006` `Dell#`
Related Commands	clock read-calendar— sets the software clock based on the hardware clock. clock set— sets the software clock. clock update-calendar— sets the hardware clock based on the software clock. show clock— displays the clock settings.

ntp server

Configure an NTP time-serving host.

Syntax `ntp server {`*`hostname`* `|` *`ipv4-address`*`} [key` *`keyid`*`] [prefer] [version` *`number`*`]`

Parameters

ipv4-address	Enter an IPv4 address (A.B.C.D).
hostname	Enter the hostname of the server.
key ***keyid***	(OPTIONAL) Enter the keyword `key` and a number as the NTP peer key. The range is from 1 to 4294967295.
prefer	(OPTIONAL) Enter the keyword `prefer` to indicate that this peer has priority over other servers.
version ***number***	(OPTIONAL) Enter the keyword `version` and a number to correspond to the NTP version used on the server. The range is from 1 to 3.

Defaults	Not configured.
Command Modes	CONFIGURATION
Command History	**Version 9.2(0.0)** Supported on the M I/O Aggregator.
Usage Information	You can configure multiple time-serving hosts (up to 250). From these time-serving hosts, the operating system chooses one NTP host with which to synchronize. Because many polls to NTP hosts can impact network performance, Dell Networking recommends limiting the number of hosts configured.

show calendar

Display the current date and time based on the switch hardware clock.

Syntax	`show calendar`
Command Modes	• EXEC • EXEC Privilege
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.

Example	`Dell#show calendar`
	`12:29:34 pacific Tue May 22 2012`
	`Dell#`

Related Commands	show clock— displays the time and date from the switch software clock.

show clock

Displays the current clock settings.

Syntax	`show clock [detail]`
Parameters	**detail** (OPTIONAL) Enter the keyword `detail` to view the source information of the clock.
Command Modes	• EXEC • EXEC Privilege

Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

Example

```
Dell#show clock
12:30:04.402 pacific Tue May 22 2012
Dell#
```

Example (Detail)

```
Dell#show clock detail
12:30:26.892 pacific Tue May 22 2012
Time source is RTC hardware
Summer time starts 00:00:00 UTC Wed Mar 14 2012
Summer time ends 00:00:00 pacific Wed Nov 7 2012
Dell#
```

Related Commands

clock summer-time recurring—displays the time and date from the switch hardware clock.

ntp server— displays the time and date from the switch hardware clock.

clock read-calendar

Set the software clock on the switch from the information set in hardware clock (calendar).

Syntax	`clock read-calendar`
Defaults	Not configured.
Command Modes	EXEC Privilege
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.
Usage Information	In the switch, the hardware clock is separate from the software and is called the calendar. This hardware clock runs continuously. After the hardware clock (the calendar) is set, the operating system automatically updates the software clock after system bootup. You cannot delete this command (there is not a `no` version of this command).

clock set

Set the software clock in the switch.

Syntax	`clock set` *time month day year*

Parameters

time	Enter the time in hours:minutes:seconds. For the hour variable, use the 24-hour format; example, 17:15:00 is 5:15 pm.
month	Enter the name of one of the 12 months, in English. You can enter the number of a day and change the order of the display to *time day month year* .
day	Enter the number of the day. The range is from 1 to 31. You can enter the name of a month to change the order of the display to *time month day year* .
year	Enter a four-digit number as the year. The range is from 1993 to 2035.

Defaults Not configured.

Command Modes EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information

You can change the order of the `month` and `day` parameters to enter the time and date as *time day month year* . You cannot delete the software clock.

The software clock runs only when the software is up. The clock restarts, based on the hardware clock, when the switch reboots.

Dell Networking recommends using an outside time source, such as NTP, to ensure accurate time on the switch.

Example

```
Dell#clock set 12:11:00 21 may 2012
Dell#
```

clock summer-time date

Set a date (and time zone) on which to convert the switch to daylight saving time on a one-time basis.

Syntax

`clock summer-time` *time-zone* `date` *start-month start-day start-year start-time end-month end-day end-year end-time* [*offset*]

To delete a daylight saving time zone configuration, use the `no clock summer-time` command.

Parameters

time-zone	Enter the three-letter name for the time zone. This name is displayed in the show clock output.

start-month	Enter the name of one of the 12 months in English. You can enter the name of a day to change the order of the display to *time day month year*.
start-day	Enter the number of the day. The range is from 1 to 31. You can enter the name of a month to change the order of the display to *time day month year*.
start-year	Enter a four-digit number as the year. The range is from 1993 to 2035.
start-time	Enter the time in hours:minutes. For the hour variable, use the 24-hour format; example, 17:15 is 5:15 pm.
end-day	Enter the number of the day. The range is from 1 to 31. You can enter the name of a month to change the order of the display to time day month year.
end-month	Enter the name of one of the 12 months in English. You can enter the name of a day to change the order of the display to time day month year.
end-time	Enter the time in hours:minutes. For the hour variable, use the 24-hour format; example, 17:15 is 5:15 pm.
end-year	Enter a four-digit number as the year. The range is from 1993 to 2035.
offset	(OPTIONAL) Enter the number of minutes to add during the summer-time period. The range is from 1 to1440. The default is **60 minutes**.

Defaults

Not configured.

Command Modes

CONFIGURATION

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Related Commands

calendar set— sets the hardware clock.

clock summer-time recurring— sets a date (and time zone) on which to convert the switch to daylight saving time each year.

show clock— displays the current clock settings.

clock summer-time recurring

Set the software clock to convert to daylight saving time on a specific day each year.

Syntax

`clock summer-time` *`time-zone`* `recurring [`*`start-week start-day start-month start-time end-week end-day end-month end-time [offset]]`*

To delete a daylight saving time zone configuration, use the `no clock summer-time` command.

Parameters

time-zone	Enter the three-letter name for the time zone. This name is displayed in the `show clock` output. You can enter up to eight characters.
start-week	(OPTIONAL) Enter one of the following as the week that daylight saving begins and then enter values for start-day through end-time: • `week-number`: Enter a number from 1 to 4 as the number of the week in the month to start daylight saving time. • `first`: Enter this keyword to start daylight saving time in the first week of the month. • `last`: Enter this keyword to start daylight saving time in the last week of the month.
start-day	Enter the name of the day that you want daylight saving time to begin. Use English three letter abbreviations; for example, Sun, Sat, Mon, and so on. The range is from Sun to Sat.
start-month	Enter the name of one of the 12 months in English.
start-time	Enter the time in hours:minutes. For the hour variable, use the 24-hour format; example, 17:15 is 5:15 pm.
end-week	Enter the one of the following as the week that daylight saving ends: • `week-number`: enter a number from 1 to 4 as the number of the week to end daylight saving time. • `first`: enter the keyword `first` to end daylight saving time in the first week of the month. • `last`: enter the keyword `last` to end daylight saving time in the last week of the month.
end-day	Enter the weekday name that you want daylight saving time to end. Enter the weekdays using the three letter abbreviations; for example Sun, Sat, Mon, and so on. The range is from Sun to Sat.
end-month	Enter the name of one of the 12 months in English.

	end-time	Enter the time in hours:minutes:seconds. For the hour variable, use the 24-hour format; example, 17:15:00 is 5:15 pm.
	offset	(OPTIONAL) Enter the number of minutes to add during the summer-time period. The range is from 1 to 1440. The default is **60 minutes**.

Defaults Not configured.

Command Modes CONFIGURATION

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Related Commands

calendar set— sets the hardware clock.

clock summer-time date— sets a date (and time zone) on which to convert the switch to daylight saving time on a one-time basis.

show clock— displays the current clock settings.

clock timezone

Configure a timezone for the switch.

Syntax `clock timezone` *`timezone-name offset`*

To delete a timezone configuration, use the `no clock timezone` command.

Parameters

timezone-name	Enter the name of the timezone. You cannot use spaces.
offset	Enter one of the following: • a number from 1 to 23 as the number of hours in addition to universal time coordinated (UTC) for the timezone. • a minus sign (-) then a number from 1 to 23 as the number of hours.

Defaults Not configured.

Command Modes CONFIGURATION

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Usage Information	Coordinated universal time (UTC) is the time standard based on the International Atomic Time standard, commonly known as Greenwich Mean time. When determining system time, include the differentiator between UTC and your local timezone. For example, San Jose, CA is the Pacific Timezone with a UTC offset of -8.

clock update-calendar

Set the switch hardware clock based on the software clock.

Syntax	`clock update-calendar`
Defaults	Not configured.
Command Modes	EXEC Privilege
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.
Usage Information	Use this command only if you are sure that the hardware clock is inaccurate and the software clock is correct. You cannot delete this command (there is not a `no` form of this command).
Related Commands	calendar set— sets the hardware clock.

24

Uplink Failure Detection (UFD)

Uplink failure detection (UFD) provides detection of the loss of upstream connectivity and, if you use this with network interface controller (NIC) teaming, automatic recovery from a failed link.

NOTE: In Standalone, VLT, and Stacking modes, the UFD group number is 1 by default and cannot be changed.

defer-timer

Configure a timer that prevents unwanted flapping of downstream ports when the uplink port channel goes down and comes up.

Syntax	`defer-timer`*`seconds`*	
Defaults	10 (Standalone mode)	
Parameters	***seconds***	Specify the time (in seconds) to wait for the upstream port channel (LAG 128) to come back up before server ports are brought down. The range is from 1 to 120.
Command Modes	UPLINK-STATE-GROUP	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator.
Usage Information	This command is not supported in programmable-mux mode.	

enable

Re-enable upstream-link tracking for an uplink-state group after it has been disabled.

Syntax	`enable` To disable upstream-link tracking without deleting the uplink-state group, use the `no enable` command.
group-id	Enables debugging on the specified uplink-state group. Valid *group-id* values are 1 to 16.

Defaults	Upstream-link tracking is automatically enabled in an uplink-state group.	
Command Modes	UPLINK-STATE-GROUP	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator.

25

Virtual Link Trunking (VLT)

Virtual link trunking (VLT) allows physical links between two chassis to appear as a single virtual link to the network core. VLT domain configuration is automatic and you must connect the base module ports for VLT interconnect (VLTi) communication. In VLT mode, all LAGs are peer-LAG VLT enabled, so you do not need to configure any VLT LAGs. If you change to VLT mode, reboot the I/O aggregator. VLT mode VLT provides Layer 2 multipathing, creating redundancy through increased bandwidth, enabling multiple parallel paths between nodes and load-balancing traffic where alternative paths exist.

The VLT commands described in this chapter are:

- show vlt backup-link
- show vlt brief
- show vlt detail
- show vlt role
- show vlt statistics
- stack-unit iom-mode

show vlt backup-link

Displays information on the backup link operation.

Syntax	`show vlt backup-link`	
Default	Not configured.	
Command Modes	EXEC	
Command History	**Version 9.2. (0.0)**	Introduced on the DELL Poweredge I/O Aggregator Switch IO Module.

Example

```
Dell# show vlt backup-link
VLT Backup Link
-----------------
Destination:                169.254.31.23
Peer HeartBeat status:      Up
HeartBeat Timer Interval:   1
HeartBeat Timeout:          3
UDP Port:                   34998
HeartBeat Messages Sent:    24
HeartBeat Messages Received: 25
```

show vlt brief

Display brief status information about VLT domains currently configured on the switch.

Syntax	`show vlt brief`	
Default	Not configured.	
Command Modes	EXEC	
Command History	**Version 9.2. (0.0)**	Introduced on the DELL Poweredge I/O Aggregator Switch IO Module.

Example (Brief)

```
Dell# show vlt brief
VLT Domain Brief
------------------
Domain ID:                        1
Role:                            Primary
Role Priority:                  32768
ICL Link Status:                Up
HeartBeat Status:               Up
VLT Peer Status:                Up
Local Unit Id:                  0
Version:                        6(1)
Local System MAC address:       00:01:e8:00:ab:03
Remote System MAC address:      00:01:e8:e1:e1:c3
Configured System MAC address:  00:01:05:08:02:05
Remote system version:          6(1)
Delay-Restore timer:            90 seconds
Peer-Routing :                  Disabled
Peer-Routing-timeout timer:      0 seconds
Multicast peer-routing timeout:  150 seconds
Dell#
```

show vlt detail

Displays detailed status information about VLT domains currently configured on the switch.

Syntax	`show vlt detail`	
Default	Not configured.	
Command Modes	EXEC	
Command History	**Version 9.2. (0.0)**	Introduced on the DELL Poweredge I/O Aggregator Switch IO Module.

Example

```
Dell# show vlt detail
Local LAG Id Peer LAG Id Local Status  Peer Status  Active
VLANs
------------ ----------- ------------  -----------
-------------
```

```
128             128             UP              UP          1000
Dell#
```

show vlt role

Display the VLT peer status, role of the local VLT switch, VLT system MAC address and system priority, and the MAC address and priority of the locally-attached VLT device.

Syntax `show vlt role`

Default Not configured.

Command Modes EXEC

Command History

Version 9.2. (0.0)	Introduced on the DELL Poweredge I/O Aggregator Switch IO Module.

Example

```
Dell#show vlt role
VLT Role
----------
VLT Role:                     Primary
System MAC address:           00:01:05:08:02:05
Primary Role Priority:        32768
Local System MAC address:     00:01:e8:00:ab:03
Local System Role Priority:   32768
Local Unit Id:                 0
Dell#
```

show vlt statistics

Displays statistics on VLT operations.

Syntax `show vlt statistics`

Default Not configured.

Command Modes EXEC

Command History

Version 9.2(0.0)	Introduced on the DELL Poweredge I/O Aggregator.

Example

```
Dell#show vlt statistics
VLT Domain Statistics
-----------------------
HeartBeat Messages Sent:     449
HeartBeat Messages Received: 448
ICL Hello's Sent:            154
ICL Hello's Received:        154
Domain Mismatch Errors:       0
```

```
Version Mismatch Errors:      0
Config Mismatch Errors:       0

VLT MAC Statistics
--------------------
L2 Info Pkts sent:16, L2 Mac-sync Pkts Sent:25
L2 Info Pkts Rcvd:15, L2 Mac-sync Pkts Rcvd:24
L2 Reg Request sent:2
L2 Reg Request rcvd:1
L2 Reg Response sent:1
L2 Reg Response rcvd:1

VLT Igmp-Snooping Statistics
------------------------------
IGMP Info Pkts sent:      9
IGMP Info Pkts Rcvd:     10
IGMP Reg Request sent:    2
IGMP Reg Request rcvd:    2
IGMP Reg Response sent:   2
IGMP Reg Response rcvd:   1
IGMP PDU Tunnel Pkt sent: 0
IGMP PDU Tunnel Pkt rcvd: 0
IGMP Tunnel PDUs sent:    0
IGMP Tunnel PDUs rcvd:    0

VLT ARP Statistics
--------------------
ARP Tunnel Pkts sent:0
ARP Tunnel Pkts Rcvd:0
ARP Tunnel Pkts sent Non Vlt:0
ARP Tunnel Pkts Rcvd Non Vlt:0
ARP-sync Pkts Sent:0
ARP-sync Pkts Rcvd:0
ARP Reg Request sent:2
ARP Reg Request rcvd:1
VLT IOA Statistics
------------------------------
IOA Info Pkts sent:    5
IOA Info Pkts Rcvd:    7
IOA Reg Request sent:  2
IOA Reg Request rcvd:  2
IOA Reg Response sent: 2
IOA Reg Response rcvd: 1
VLT NDP Statistics
--------------------
NDP NA VLT Tunnel Pkts sent:0
NDP NA VLT Tunnel Pkts Rcvd:0
NDP NA Non-VLT Tunnel Pkts sent:0
NDP NA Non-VLT Tunnel Pkts Rcvd:0
Ndp-sync Pkts Sent:0
Ndp-sync Pkts Rcvd:0
Ndp Reg Request sent:2
Ndp Reg Request rcvd:1
VLT multicast not enabled
```

stack-unit iom-mode

Set the M I/O Aggregator operating mode to VLT mode.

Syntax

```
stack-unit <unit-number> iom-mode vlt
```

Parameters

unit number *<0-5>*	Enter the number of the member stack unit. The range is from 0 to 5. The default is 0.
vlt	Enable virtual link trunking mode.

Command Modes

- CONFIGURATION

Command History

Version 9.2(0.0)	Introduced on the DELL Poweredge I/O Aggregator Switch IO Module.

Usage Information

This command resets the operating mode to VLT. You must reboot the I/O Aggregator after using this command.

26

Debugging and Diagnostics

This chapter contains the following sections:

- Offline Diagnostic Commands
- Hardware Commands

Offline Diagnostic Commands

The offline diagnostics test suite is useful for isolating faults and debugging hardware. While tests are running, the Dell Networking OS results are saved as a text file (TestReport-SU-X.txt) in the flash directory. The `show file` command is available only on Master and Standby.

Important Points to Remember

- Offline diagnostics can only be run when the unit is offline.
- Offline diagnostics cannot be run in Stacking mode.
- You can only run offline diagnostics on a unit to which you are connected via the console. In other words, you cannot run diagnostics on a unit to which you are connected via a stacking link.
- Diagnostic results are stored in a file (TestReport-SU-X.txt) in the flash directory. To review the results, use the `show file` command, which prints the results to the screen.
- Diagnostics only test connectivity, not the entire data path.

The offline diagnostics commands are:

- diag stack-unit
- offline stack-unit
- show diag

Hardware Commands

These commands display information from a hardware sub-component or ASIC.

The hardware commands are:

- clear hardware stack-unit
- show diag
- show hardware stack-unit
- show hardware system-flow

clear hardware stack-unit

Clear statistics from selected hardware components.

Syntax

```
clear hardware stack-unit 0–5 {counters | unit 0–1 counters |
cpu data-plane statistics | cpu party-bus statistics | stack-
port 0–52}
```

Parameters

stack-unit *0–5*	Enter the keywords `stack-unit` then 0 to 5 to select a particular stack member and then enter one of the following command options to clear a specific collection of data.
counters	Enter the keyword `counters` to clear the counters on the selected stack member.
unit *0–0* counters	Enter the keyword `unit` along with a port-pipe number, from *0 to 1* , then the keyword `counters` to clear the counters on the selected port-pipe.
cpu data-plane statistics	Enter the keywords `cpu data-plane statistics` to clear the data plane statistics.
cpu party-bus statistics	Enter the keywords `cpu party-bus statistics` to clear the management statistics.
stack-port *33–56*	Enter the keywords `stack-port` then the port number of the stacking port to clear the statistics of the particular stacking port. The range is from 33 to 56.

NOTE: You can identify stack port numbers by physical inspection of the rear modules. The numbering is the same as for the 10G ports. You can also inspect the output of the `show system stack-ports` command.

Defaults none

Command Modes EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Related Commands show diag— displays the data plane or management plane input and output statistics of the designated component of the designated stack member.

diag stack-unit

Run offline diagnostics on a stack unit.

Syntax

```
diag stack-unit number {alllevels | level0 | level1 | level2
[verbose no-reboot]| terminate| interactive test <id>}
```

Parameters

number	Enter the stack-unit number. The range is from 0 to 5.
alllevels	Enter the keyword `alllevels` to run the complete set of offline diagnostic tests.
level0	Enter the keyword `level0` to run Level 0 diagnostics. Level 0 diagnostics check for the presence of various components and perform essential path verifications. In addition, they verify the identification registers of the components on the board.
level1	Enter the keyword `Level1` to run Level 1 diagnostics. Level 1 diagnostics is a smaller set of diagnostic tests with support for automatic partitioning. They perform status/self test for all the components on the board and test their registers for appropriate values. In addition, they perform extensive tests on memory devices (for example, SDRAM, flash, NVRAM, EEPROM, and CPLD) wherever possible. There are no tests on 10G links. At this level, stack ports are shut down automatically.
level2	Enter the keyword `level2` to run Level 2 diagnostics. Level 2 diagnostics are a full set of diagnostic tests with no support for automatic partitioning. Level 2 diagnostics are used primarily for on-board loopback tests and more extensive component diagnostics. Various components on the board are put into Loopback mode and test packets are transmitted through those components. These diagnostics also perform snake tests using VLAN configurations. To test 10G links, physically remove the unit from the stack.
verbose	Enter the keyword `verbose` to run the diagnostic in Verbose mode. Verbose mode gives more information in the output than Standard mode.
no-reboot	Enter the keyword `no-reboot` to avoid automatic rebooting of the chassis after completion of diagnostic execution. Generally, this option is never used because if you run the diagnostic once again without rebooting the chassis, it may cause an issue with the diagnostic results..
terminate	Enter the keyword `terminate` to stop the execution of the level diag that is already started using the diag stack-unit command. Once this CLI is issued, syslogs indicating the termination of the diag test is displayed. The diag results for the executed tests are stored in the flash directory (TestReport-SU-X.txt).
interactive	Enter the keyword `interactive` to run some individual diag tests such as POWERLEDTEST, STATUSLEDTEST and so on. The help option under the interactive command displays the list of tests that can be run.

Defaults	none	
Command Modes	EXEC Privilege	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.

hardware watchdog

Set the watchdog timer to trigger a reboot and restart the system.

Syntax	`hardware watchdog`	
Defaults	Enabled	
Command Modes	• CONFIGURATION	
Command History	**Version 8.3.17.0**	Supported on the M I/O Aggregator.
Usage Information	This command enables a hardware watchdog mechanism that automatically reboots an Dell Networking OS switch/router with a single unresponsive unit. This is a last resort mechanism intended to prevent a manual power cycle.	

offline stack-unit

Place a stack unit in the offline state.

Syntax	`offline stack-unit` *number*	
Parameters	***number***	Enter the stack-unit number. The range is from 0 to 5.
Defaults	none	
Command Modes	EXEC Privilege	
Command History	**Version 9.4(0.0)**	Supported on the FN I/O aggregator.
Usage Information	While executing the offline stack unit CLI, the following warning message is displayed:	

```
Dell#offline stack-unit 0
Warning - offline of unit will bring down all the protocols and
```

```
the unit will be operationally down, except for running
Diagnostics.
Please make sure that stacking/fanout not configured for
Diagnostics execution.
Also reboot/online command is necessary for normal operation
after the offline command is issued.
Proceed with Offline [confirm yes/no]:no
Dell#
```

Make sure that stacking is not configured for Diagnostics execution. Also, reboot/online command is necessary for normal operation after the offline command is issued.

show diag

View diagnostics information.

Syntax

```
show diag {information | stack-unit number [detail | periodic |
summary] | testcase}
```

Parameters

information	Enter the keyword `information` to view current diagnostics information in the system.
stack-unit *unit-id*	Enter the keyword `stack-unit` followed by the *`unit-id`* to display information on a specific stack member. The range is from 0 to 5.
detail	(OPTIONAL) Enter the keyword `detail` to view detailed diagnostics information.
summary	(OPTIONAL) Enter the keyword `summary` to view a summary of the diagnostics information. By default, the summary is displayed.
testcase	Enter the keyword `testcase` to view the list of all the diag tests available.

Defaults Summary

Command Modes EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Example 1 (show diag information Command)

```
Dell#show diag information
Diag information:
Diag software image version:
8-3-17-36
------------------------------------------------------------------
----
Stack-unit Member 0: Unit diags are terminated (Stackunit
Offline).
Stack-unit Member 1: Not present.
```

```
Stack-unit Member 2: Not present.
Stack-unit Member 3: Not present.
Stack-unit Member 4: Not present.
Stack-unit Member 5: Not present.
-----------------------------------------------------------------
----
```

Example 2 (show diag stack-unit Command)

```
Dell#show diag stackunit 0
Diag status of Stackunit member 0:
-----------------------------------------------------------------
-----------
Stackunit is currently offline.
Stackunit level0 diag issued at Tue May 15, 2012 11:11:47 AM.
Current diag status:     Unit diags are terminated.
Total number of diags:         17
Number of diags performed:      1
Number of diags passed:         1
Number of diags failed:         0
Number of diags pending:        16
Last Test executed:             POWERRAILSTATUSTEST
Last notification received at:  Tue May 15, 2012 11:12:24 AM
-----------------------------------------------------------------
-----------
```

Example 3 (show diag testcase stack-unit Command)

```
Dell#show diag testcase stack-unit 0
*************************** Navasota Diagnostics Test
************************
Test ID Test Description               Test Level
------- ----------------               ----------
1 POWERRAILSTATUSTEST                    Level0
2 OPTMODSLOTPOWERSTATUSTEST              Level0
3 TSENSORACCESSTEST                      Level0
4 RTCPRESENCETEST                        Level0
5 CPUSDRAMPRESENCETEST                   Level0
6 CPUSDRAMSIZETEST                       Level0
7 USBAACCESSTEST                         Level0
8 USBHOSTCONTROLLERACCESSTEST            Level0
9 SDFLASHACCESSTEST                      Level0
10 QSFPPLUSPOWERMODETEST                 Level0
11 CPLDPRESENCETEST                      Level0
12 FLASHACCESSTEST                       Level0
13 BOARDREVTEST                          Level0
14 MGMTPHYPRESENCETEST                   Level0
15 OPTMODTYPETEST                        Level0
16 QSFPPLUSPRESENCETEST                  Level0
17 CPUTYPEDETECTTEST                     Level0
101 RTCFUNCTIONTEST                      Level1
102 RTCROLLOVERTEST                      Level1
103 GPIOACCESSTEST                       Level1
104 PSOCACCESSTEST                       Level1
105 PCIEBCM56846ACCESSTEST               Level1
106 CPUSDRAMACCESSTEST                   Level1
107 CPUSDRAMDATALINETEST                 Level1
108 CPUSDRAMADDRESSLINETEST              Level1
109 USBFILECOPYTEST                      Level1
110 FLASHRWTEST                          Level1
111 I2CSTRESSTEST                        Level1
112 AVSPOWERCNTRLACCESSTEST              Level1
113 SERVERPORTPHYACCESSTEST              Level1
114 SERVERPORTPHYRWTEST                  Level1
115 QSFPPLUSPHYACCESSTEST                Level1
116 QSFPPLUSPHYRWTEST                    Level1
```

```
117 QSFPPLUSPHYEXTLINKTEST               Level1
118 QSFPPLUSEEPROMTEST                   Level1
119 OPTMODPHYACCESSTEST                  Level1
120 OPTMODPHYRWTEST                      Level1
121 OPTMODPHYEXTLINKTEST                 Level1
122 OPTMODMODULEEEPROMTEST               Level1
123 MGMTPHYACCESSTEST                    Level1
124 SDFLASHFILECOPYSTRESSTEST            Level1
201 QSFPPLUSPHYLNKSPEEDTEST              Level2
202 OPTMODPHYLNKSPEEDTEST                Level2
203 MGMTPHYLOOPBACKTEST                  Level2
204 MGMTMACLOOPBACKTEST                  Level2
205 CPUSNAKESERVERPORTPHYLPBKTEST        Level2
206 CPUSNAKESERVERPORTMACLPBKTEST        Level2
207 CPUSNAKEQSFPPPHYLPBKTEST             Level2
208 CPUSNAKEQSFPPMACLPBKTEST             Level2
209 CPUSNAKEOPTMODPHYLPBKTEST            Level2
210 CPUSNAKEOPTMODMACLPBKTEST            Level2
Total Diagnostic Testcases in All Levels: 51
************************************ END
************************************
```

Example 4 (show diag testcase stack-unit interactive Command)

```
Dell#show diag testcase stack-unit 0 interactive
*************************** Navasota Diagnostics Test
************************
Test ID Test Description    Test Level
------- ----------------    ----------
401 POWERLEDTEST              Interactive
402 DEBUGLEDTEST              Interactive
403 STATUSLEDTEST             Interactive
404 OPTMODLEDCONTROLTEST      Interactive
405 FIXEDLEDCONTROLTEST       Interactive
406 RTCBATTERYTEST            Interactive
407 CPLDRESETTEST             Interactive
408 I2CDEVICESCANTEST         Interactive
409 SERVERPORTPHYEXTLINKTEST  Interactive
410 CPUSNAKEQSFPPEXTLPBKTEST  Interactive
411 CPUSNAKEOPTMODEXTLPBKTEST Interactive
Total Diagnostic Testcases in Interactive: 11
************************************ END
************************************
```

show hardware stack-unit

Display the data plane or management plane input and output statistics of the designated component of the designated stack member.

Syntax

```
show hardware stack-unit 0-5 {buffer [buffer unit | port
[(1-56) | all] total buffer | buffer unit (1) port (1-56) queue
[(0-14) | a11] buffer-info} {phy-firmware-version} {cpu data-
plane statistics [stack-port 0-52] | cpu party-bus statistics |
cpu private-mgmt statistics | drops [unit 0-1 [port 1-56]] |
stack-port 33-56 | unit 0-0 {counters | details | port-stats
[detail] | register}}
```

Parameters

stack-unit *0–5* {command-option}	Enter the keywords `stack-unit` then 0 to 5 to select a particular stack member and then enter one of the following command options to display a collection of data based on the option entered.
buffer	Enter the keyword `buffer`. To display the total buffer statistics for the stack unit, enter the keyword `total-buffer`. Enter the keywords `buffer unit` then `total-buffer` to display the buffer details per unit and mode of allocation. To display the forwarding plane statistics containing the packet buffer usage per port per stack unit, enter the keywords `buffer unit` then `port` and the port number (*`1-56`* or `all`), then `buffer-info`. To display the forwarding plane statistics containing the packet buffer statistics per COS per port, enter the keywords `buffer unit` and `port (1-56)`, and `queue` (*`0-14`* or `all`), and `buffer-info`. The buffer unit default is **1**.
fpga	Enter the keyword `fpga`, to display fpga details.
fru	Enter the keyword `fru`, to display fru details.
phy-firmware-version	Each member of the stack is updated automatically with the latest firmware while booting as well as during OIR. To dump the physical firmware version for stack units, enter the keywords `phy-firmware-version`.
cpu data-plane statistics	Enter the keywords `cpu data-plane statistics` , optionally followed by the keywords `stack port` and its number from 0 to 52 to display the data plane statistics, which shows the High Gig (Higig) port raw input/output counter statistics to which the stacking module is connected.
cpu party-bus statistics	Enter the keywords `cpu party-bus statistics`, to display the Management plane input/output counter statistics of the Private Management interface.
cpu private-mgmt statistics	Enter the keywords `cpu private-mgmt statistics`, to display the Management plane input/output counter statistics of the Private Management interface.
drops [unit *0-0* [port *1-56*]]	Enter the keyword `drops` to display internal drops on the selected stack member. Optionally, use the keyword `unit` with 0 to select port-pipe 0, and then use `port 1-56` to select a port on that port-pipe.
stack-port *33–56*	Enter the keywords `stack-port` and a stacking port number to select a stacking port for which to display statistics. Identify the stack port number as you would to identify a 10G port that was in the same place in one of the rear modules.

NOTE: You can identify stack port numbers by physical inspection of the rear modules. The numbering is the same as for the 10G ports. You can also inspect the output of the `show system stack-ports` command.

unit *0–0* {counters | details | port-stats [detail] | register}	Enter the keyword `unit` then 0 for port-pipe 0, and then enter one of the following keywords to troubleshoot errors on the selected port-pipe and to give status on why a port is not coming up to register level: `counters`, `details`, `port-stats [detail]`, or `register`.

Defaults none

Command Modes
- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Example (show hardware stack-unit phy-firmware-version Command)

```
Dell#show hardware stack-unit 1 phy-firmware-version
PortNumber     Status        Programmed Version            SW
Version
=================================================================
========
41             Present          01.05
01.05
42             Present          01.05
01.05
43             Present          01.05
01.05
44             Present          01.05
01.05
45             Not Present      N/A
N/A
46             Not Present      N/A
N/A
47             Not Present      N/A
N/A
48             Not Present      N/A
N/A
49             Present         01.06
01.06
50             Present         01.06
01.06
51             Present         01.06
01.06
52             Present         01.06
01.06
53             Present         01.06
01.06
54             Present         01.06
01.06
55             Present         01.06
01.06
56             Present         01.06
01.06
Dell#
```

In the above example, the *Status* field represents presence of OPTM ports, *Programmed version* field represents loaded firmware version, and *SW version* represents the SDK version.

Example (data-plane)

```
Dell#show hardware stack-unit 1 cpu data-plane statistics

bc pci driver statistics for device:
rxHandle        :7392
noMhdr          :0
noMbuf          :0
noClus          :0
recvd           :7392
dropped         :0
recvToNet       :7392
rxError         :0
rxDatapathErr   :0
rxPkt(COS0)     :0
rxPkt(COS1)     :0
rxPkt(COS2)     :10
rxPkt(COS3)     :0
rxPkt(COS4)     :0
rxPkt(COS5)     :338
rxPkt(COS6)     :0
rxPkt(COS7)     :7044
rxPkt(UNIT0)    :7392
transmitted     :29899
txRequested     :29899
noTxDesc        : 0
txError         :0
txReqTooLarge   :0
txInternalError :0
txDatapathErr   :0
txPkt(COS0)     :0
txPkt(COS1)     :0
txPkt(COS2)     :0
txPkt(COS3)     :0
txPkt(COS4)     :0
txPkt(COS5)     :0
txPkt(COS6)     :0
txPkt(COS7)     :0
txPkt(UNIT0)    :0
Dell#
```

Example

```
Dell#show hardware stack-unit 1 cpu party-bus statistics
Input Statistics:
8189 packets, 8076608 bytes
0 dropped, 0 errors
Output Statistics:
366 packets, 133100 bytes
0 errors
Dell#
```

Example (drops)

```
Dell#show hard stack-unit 1 drops
UNIT No: 0

Total Ingress Drops : 7448
Total IngMac Drops : 0
Total Mmu Drops :    0
Total EgMac Drops :  0
```

```
Total Egress Drops : 16
Dell#
```

Example (drop summary)

```
Dell#show hardware stack-unit 1 drops unit 0
UserPort PortNumber      Ingress Drops   IngMac Drops
Total Mmu Drops     EgMac
Drops   Egress Drops
1          1                0
0                   0               0
0
2          2                0
0                   0               0
0
3          3                0
0                   0               0
0
4          4                0
0                   0               0
0
5          5                728
0                    0                0
5
6          6                0
0                    0                0
0
7          7                0
0                   0                0
0
8          8                0
0                     0                0
0
9          9                0
0                     0                0
0
10         10               0
0                     0                0
0
--More--
Dell#
```

Example (drop counters)

```
Dell#show hardware stack-unit 0 drops unit 0 port 27
  --- Ingress Drops ---
Ingress Drops               : 0
IBP CBP Full Drops          : 0
PortSTPnotFwd Drops         : 0
IPv4 L3 Discards            : 0
Policy Discards             : 0
Packets dropped by FP       : 0
(L2+L3) Drops               : 0
Port bitmap zero Drops      : 0
Rx VLAN Drops               : 0
  --- Ingress MAC counters---
Ingress FCSDrops            : 0
Ingress MTUExceeds          : 0
  --- MMU Drops ---
HOL DROPS                   : 0
TxPurge CellErr             : 0
Aged Drops                  : 0
  --- Egress MAC counters---
Egress FCS Drops            : 0
  --- Egress FORWARD PROCESSOR Drops ---
IPv4 L3UC Aged & Drops      : 0
```

```
TTL Threshold Drops         : 0
INVALID VLAN CNTR Drops     : 0
L2MC Drops                  : 0
PKT Drops of ANY Conditions : 0
Hg MacUnderflow             : 0
TX Err PKT Counter          : 0 25
Dell#
```

Example (port-statistics)

```
Dell#show hardware stack-unit 1 unit 0 port-stats
     ena/ speed/ link auto STP               lrn inter
max    loop
port link duplex scan neg?   state  pause discrd ops face
frame back
xe0 !ena  1G FD      SW Yes Forward        Tag    F   GMII 1550
xe1 !ena  1G FD      SW Yes Forward        Tag    F   GMII 1554
xe2 up    1G FD      SW Yes Forward        None   FA  GMII
11996
xe3 !ena  1G FD      SW Yes Forward        Tag    F   GMII 1550
xe4 down  10G FD     SW Yes Block          None   FA   KR 8996
xe5 !ena  1G FD      SW Yes Forward        Tag    F   GMII 1550
xe6 !ena  1G FD      SW Yes Forward        Tag    F   GMII 1550
xe7 !ena  1G FD      SW Yes Forward        Tag    F   GMII 1550
xe8 !ena  1G FD      SW Yes Forward        Tag    F   GMII 1550
xe9 !ena  1G FD      SW Yes Forward        Tag    F   GMII 1550
xe10 down 10G FD     SW Yes Forward        Tag    F    KR 1550
xe11 !ena 1G FD      SW Yes Forward        Tag    F   GMII 1550
xe12 !ena 1G FD      SW Yes Block          None   FA  GMII
11996
xe13 !ena 1G FD      SW Yes Forward        Tag    F   GMII 1550
xe14 !ena 1G FD      SW Yes Forward        Tag    F   GMII 1550
xe15 !ena 1G FD      SW Yes Forward        Tag    F   GMII 1550
xe16 !ena 1G FD      SW Yes Forward        Tag    F   GMII 1550
xe17 !ena 1G FD      SW Yes Forward        Tag    F   GMII 1550
xe18 down 1G FD      SW Yes Forward        Tag    F   GMII 1550
xe19 !ena 1G FD      SW Yes Forward        Tag    F   GMII 1550
xe20 down 1G FD      SW Yes Forward        Tag    F   GMII 1550
--More--
Dell#
```

Example (register)

```
Dell#show hardware stack-unit 0 unit 0 register
0x0f180d34 ALTERNATE_EMIRROR_BITMAP_PARITY_CONTROL.ipipe0 =
0x00000001
0x0f180d35 ALTERNATE_EMIRROR_BITMAP_PARITY_STATUS_INTR.ipipe0
= 0x00000000
0x0f180d36 ALTERNATE_EMIRROR_BITMAP_PARITY_STATUS_NACK.ipipe0
= 0x00000000
0x0018070c ARB_EOP_DEBUG.ipipe0 = 0x00000000
0x00180312 ARB_RAM_DBGCTRL.ipipe0 = 0x00000000
0x03300000 ASF_PORT_SPEED.cpu0 = 0x00000000
0x03322000 ASF_PORT_SPEED.xe0 = 0x00000000
0x03326000 ASF_PORT_SPEED.xe1 = 0x00000000
0x0332a000 ASF_PORT_SPEED.xe2 = 0x00000007
0x0332e000 ASF_PORT_SPEED.xe3 = 0x00000000
0x03323000 ASF_PORT_SPEED.xe4 = 0x00000000
0x03327000 ASF_PORT_SPEED.xe5 = 0x00000000
0x0332b000 ASF_PORT_SPEED.xe6 = 0x00000000
0x0332f000 ASF_PORT_SPEED.xe7 = 0x00000000
0x03324000 ASF_PORT_SPEED.xe8 = 0x00000000
0x03328000 ASF_PORT_SPEED.xe9 = 0x00000000
0x0332c000 ASF_PORT_SPEED.xe10 = 0x00000000
0x03330000 ASF_PORT_SPEED.xe11 = 0x00000000
0x03325000 ASF_PORT_SPEED.xe12 = 0x00000000
```

```
0x03329000 ASF_PORT_SPEED.xe13 = 0x00000000
0x0332d000 ASF_PORT_SPEED.xe14 = 0x00000000
0x03331000 ASF_PORT_SPEED.xe15 = 0x00000000
0x03332000 ASF_PORT_SPEED.xe16 = 0x00000000
0x03336000 ASF_PORT_SPEED.xe17 = 0x00000000
0x0333a000 ASF_PORT_SPEED.xe18 = 0x00000000
0x0333e000 ASF_PORT_SPEED.xe19 = 0x00000000
0x03333000 ASF_PORT_SPEED.xe20 = 0x00000000
0x03337000 ASF_PORT_SPEED.xe21 = 0x00000000
0x0333b000 ASF_PORT_SPEED.xe22 = 0x00000000
0x0333f000 ASF_PORT_SPEED.xe23 = 0x00000000
0x03334000 ASF_PORT_SPEED.xe24 = 0x00000000
0x03338000 ASF_PORT_SPEED.xe25 = 0x00000000
0x0333c000 ASF_PORT_SPEED.xe26 = 0x00000000
0x03340000 ASF_PORT_SPEED.xe27 = 0x00000000
0x03335000 ASF_PORT_SPEED.xe28 = 0x00000000
0x03339000 ASF_PORT_SPEED.xe29 = 0x00000000
!------------------ output truncated ---------------!
```

Example (unit details)

```
Dell#show hardware stack-unit 0 unit 0 details
*****************************************************
The total no of FP & CSF Devices in the Card is 1
The total no of FP Devices in the Card is 1
The total no of CSF Devices in the Card is 0
The number of ports in device 0 is - 49
The number of Hg ports in devices 0 is - 1
The CPU Port of the device is 0
The staring unit no the SWF in the device is 0
*****************************************************
bcmLinkMonStatusShow: The Current Link Status Is
Front End Link Status 0x20000000000000000000000
Front End Port Present Status 0x000000000000000000000000
Back Plane Link Status 0x00000000
*****************************************************
Link Status of all the ports in the Device - 0
The linkStatus of Front End Port 1 is FALSE
The linkStatus of Front End Port 2 is FALSE
The linkStatus of Front End Port 3 is TRUE
The linkStatus of Front End Port 4 is FALSE
The linkStatus of Front End Port 5 is FALSE
The linkStatus of Front End Port 6 is FALSE
The linkStatus of Front End Port 7 is FALSE
The linkStatus of Front End Port 8 is FALSE
The linkStatus of Front End Port 9 is FALSE
The linkStatus of Front End Port 10 is FALSE
The linkStatus of Front End Port 11 is FALSE
The linkStatus of Front End Port 12 is FALSE
The linkStatus of Front End Port 13 is FALSE
The linkStatus of Front End Port 14 is FALSE
The linkStatus of Front End Port 15 is FALSE
The linkStatus of Front End Port 16 is FALSE
The linkStatus of Front End Port 17 is FALSE
The linkStatus of Front End Port 18 is FALSE
The linkStatus of Front End Port 19 is FALSE
The linkStatus of Front End Port 20 is FALSE
The linkStatus of Front End Port 21 is FALSE
The linkStatus of Front End Port 22 is FALSE
The linkStatus of Front End Port 23 is FALSE
The linkStatus of Front End Port 24 is FALSE
The linkStatus of Front End Port 25 is FALSE
The linkStatus of Front End Port 26 is FALSE
The linkStatus of Front End Port 27 is FALSE
The linkStatus of Front End Port 28 is FALSE
```

```
The linkStatus of Front End Port 29 is FALSE
The linkStatus of Front End Port 30 is FALSE
The linkStatus of Front End Port 31 is FALSE
The linkStatus of Front End Port 32 is FALSE
The linkStatus of Front End Port 37 is FALSE
!------------------ output truncated ---------------!
```

Example (buffer)

```
Dell#show hardware stack-unit 0 buffer total-buffer
Dell#sh hardware stack-unit 0 buffer total-buffer
Total Buffers allocated per Stack-Unit 46080
```

Example (specific port)

```
Dell(conf)#show hardware stack-unit 0 buffer unit 0 port 1
buffer-info
----- Buffer Stats for Unit 0 Port 1 -----
Maximum Shared Limit for the Port: 30720
Default Packet Buffer allocate for the Port: 120
Used Packet Buffer for the Port: 0
```

Example (queue buffer)

```
Dell(conf)#show hardware stack-unit 0 buffer unit 0 port 1
queue 2 buffer-info
----- Buffer Stats for Unit 0 Port 1 Queue 2 -----
Maximum Shared Limit: 30720
Default Packet Buffer allocate for the Queue: 8
Used Packet Buffer: 0
```

Related Commands

show interfaces stack-unit — displays information on all interfaces on a specific stack member.

show processes cpu — displays CPU usage information based on running processes.

show system stack-ports — displays information about the stacking ports on all switches in the stack.

show system — displays the current status of all stack members or a specific member.

show hardware system-flow

Display Layer 2 ACL or QoS data for the selected stack member and stack member port-pipe.

Syntax

```
show hardware system-flow layer2 stack-unit 0–5 port-set 0–0
[counters]
```

Parameters

acl | qos	For the selected stack member and stack member port-pipe, display which system flow entry the packet hits and what queue the packet takes as it dumps the raw system flow tables.
stack-unit *0–5*	Enter the keywords `stack-unit` then 0 to 5 to select a stack member ID.

port-set *0–0* [counters]	Enter the keywords `port-set` with a port-pipe number—0. (OPTIONAL) Enter the keyword `counters` to display hit counters for the selected ACL or QoS option.

Defaults none

Command Modes EXEC Privilege

Command History

Version 8.3.17.0	Supported on the M I/O Aggregator.

Example

```
Dell#show hardware system-flow layer2 stack-unit 0 port-set 0
counters
-----------------------------------------------------------------
EntryId  Description                #HITS
-----------------------------------------------------------------
2048     STP BPDU Redirects          0
2047     LLDP BPDU Redirects         164904
2045     LACP traffic Redirects      0
2044     GVRP traffic Redirects      0
2043     ARP Reply Redirects         0
2042     802.1x frames Redirects     0
2041     VRRP frames Redirects       0
2040     IPv6VRRP frames Redirects   0
2039     GRAT ARP                    0
2036     IPv6 Mcast Control Traffic  128840
2000     VLT ARP SYNC Frames         0
1999     ICL Hellos                  0
1998     ICL MAC SYNC Frames         0
1997     VLT Tunneled STP Frames     0
1995     DROP Cases                  43207
1917     L3 Term Traffic ClassID 1 to Q6       0
1916     L3 CPU Bound Traffic ClassId 2 to Q5  0
1915     Unknown MCAST Packets                 0
1792     BGP with TTL1, L4 SRC port Redirects  0
1791     BGP with TTL1, L4 DST Port Redirects  0
25
Dell#
```

Example (non-counters)

```
Dell#show hardware system-flow layer2 stack-unit 0 port-set 0

############### FP Entry for redirecting STP BPDU to CPU Port
################
EID 2048: gid=1,
    slice=15, slice_idx=0x00, prio=0x800, flags=0x82, Installed
        tcam: color_indep=0, higig=0, higig_mask=0,
        KEY=0x00000000 00000000 00000000 0180c200 00000000
00000000 00000000
, FPF4=0x00
        MASK=0x00000000 00000000 00000000 ffffffff ffff0000
00000000 00000000
,       0x00
          action={act=Drop, param0=0(0x00), param1=0(0x00)},
          action={act=CosQCpuNew, param0=7(0x07),
param1=0(0x00)},
          action={act=CopyToCpu, param0=0(0x00),
param1=0(0x00)},
          action={act=UpdateCounter, param0=1(0x01),
```

```
param1=0(0x00)},
          meter=NULL,
          counter={idx=0, mode=0x01, entries=1}

################ FP Entry for redirecting LLDP BPDU to RSM
################
EID 2047: gid=1,
          slice=15, slice_idx=0x01, prio=0x7ff, flags=0x82,
Installed
             tcam: color_indep=0, higig=0, higig_mask=0,
             KEY=0x00000000 00000000 00000000 0180c200
000e0000 00000000 00000000
, FPF4=0x00
          MASK=0x00000000 00000000 00000000 ffffffff ffff0000
00000000 00000000
,      0x00
action={act=Drop, param0=0(0x00), param1=0(0x00)},
          action={act=CosQCpuNew, param0=7(0x07),
param1=0(0x00)},
          action={act=CopyToCpu, param0=0(0x00),
param1=0(0x00)},
          action={act=UpdateCounter, param0=1(0x01),
param1=0(0x00)},
          meter=NULL,
          counter={idx=1, mode=0x01, entries=1}

############## FP Entry for redirecting LACP traffic to CPU
Port ############
EID 2045: gid=1,
          slice=15, slice_idx=0x02, prio=0x7fd, flags=0x82,
Installed
            tcam: color_indep=0, higig=0, higig_mask=0,
            KEY=0x00000000 00000000 00000000 0180c200 00020000
00000000 00000000
, FPF4=0x00
            MASK=0x00000000 00000000 00000000 ffffffff ffff0000
00000000 00000000
,      0x00
          action={act=Drop, param0=0(0x00), param1=0(0x00)},
          action={act=CosQCpuNew, param0=7(0x07),
param1=0(0x00)},
          action={act=CopyToCpu, param0=0(0x00),
param1=0(0x00)},
          action={act=UpdateCounter, param0=1(0x01),
param1=0(0x00)},
          meter=NULL,
          counter={idx=2, mode=0x01, entries=1}

################# FP Entry for redirecting GVRP traffic to RSM
############
EID 2044: gid=1,
         slice=15, slice_idx=0x03, prio=0x7fc, flags=0x82,
Installed
           tcam: color_indep=0, higig=0, higig_mask=0,
           KEY=0x00000000 00000000 00000000 0180c200 00210000
00000000 00000000
, FPF4=0x00
           MASK=0x00000000 00000000 00000000 ffffffff ffff0000
00000000 00000000
,      0x00
           action={act=Drop, param0=0(0x00), param1=0(0x00)},
           action={act=CosQCpuNew, param0=7(0x07),
param1=0(0x00)},
           action={act=CopyToCpu, param0=0(0x00),
```

```
param1=0(0x00)},
           action={act=UpdateCounter, param0=1(0x01),
param1=0(0x00)},
           meter=NULL,
           counter={idx=3, mode=0x01, entries=1}

################# FP Entry for redirecting ARP Replies to RSM
#############
EID 2043: gid=1,
           slice=15, slice_idx=0x04, prio=0x7fb, flags=0x82,
Installed
             tcam: color_indep=0, higig=0, higig_mask=0,
             KEY=0x00000000 00000000 00000000 00000000
00000000 00000806 00001600
, FPF4=0x00
             MASK=0x00000000 00000000 00000000 00000000
00000000 0000ffff 00001600
,      0x00
           action={act=Drop, param0=0(0x00), param1=0(0x00)},
           action={act=CosQCpuNew, param0=6(0x06),
param1=0(0x00)},
           action={act=CopyToCpu, param0=0(0x00),
param1=0(0x00)},
           action={act=UpdateCounter, param0=1(0x01),
param1=0(0x00)},
!--------- output truncated -----------------!
```

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FC Flex IO Modules

This part provides a generic, broad-level description of the operations, capabilities, and configuration commands of the Fiber Channel (FC) Flex IO module.

FC Flex IO Modules

This part provides a generic, broad-level description of the operations, capabilities, and configuration commands of the Fiber Channel (FC) Flex IO module.

Data Center Bridging (DCB) for FC Flex IO Modules

Data center bridging (DCB) refers to a set of IEEE Ethernet enhancements that provide data centers with a single, robust, converged network to support multiple traffic types, including local area network (LAN), server, and storage traffic.

The Fibre Channel (FC) Flex IO module is supported on Dell Networking OS MXL 10/40GbE Switch and Dell PowerEdge IO Aggregator (IOA). The MXL and IOA switch installed with the FC Flex IO module functions as a top-of-rack edge switch that supports converged enhanced ethernet (CEE) traffic — Fibre channel over Ethernet (FCoE) for storage, inter-process communication (IPC) for servers, and Ethernet local area network (LAN) (IP cloud) for data — as well as FC links to one or more storage area network (SAN) fabrics.

The `dcb-input` and `dcb-output` configuration commands are deprecated, starting with Dell Networking OS Release 9.3.0.0 on the M I/O Aggregator. You must use the `dcp-map` command to create a DCB map to configure priority flow control (PFC) and enhanced transmission selection (ETS) on Ethernet ports that support converged Ethernet traffic.

The Dell Networking Operating System (OS) commands for data center bridging features include 802.1Qbb priority-based flow control (PFC), 802.1Qaz enhanced transmission selection (ETS), and the data center bridging exchange (DCBX) protocol.

Interworking of DCB Map With DCB Buffer Threshold Settings

DCB map functionality is supported on the Aggregator.

The `dcb-input` and `dcb-output` configuration commands are deprecated. You must use the `dcp-map` command to create a DCB map to configure priority flow control (PFC) and enhanced transmission selection (ETS) on Ethernet ports that support converged Ethernet traffic.

Configure the `dcb-buffer-threshold` command and its related parameters only on ports with either auto configuration or dcb-map configuration. This command is not supported on existing front-panel interfaces or stack ports that are configured with the `dcb-input` or `dcb-output` commands. Similarly, if the dcb-buffer-threshold configuration is present on a stack port or any interface, the dcb-input or dcb-ouput policies cannot be applied on those interfaces.

Example: When the dcb-buffer-threshold policy is applied on interfaces or stack ports with the dcb-input or dcb-output policies, the following error message is displayed:

```
%Error: dcb-buffer-threshold not supported on interfaces with deprecated
commands
```

Example: When the dcb-input or dcb-output policy is configured on interfaces or stack ports with the dcb-buffer threshold policy, the following error message is displayed:

```
%Error: Deprecated command is not supported on interfaces with dcb-buffer-
threshold configured
```

You must not modify the service-class dot1p mappings when any buffer-threshold-policy is configured on the system.

```
Dell(conf)#service-class dot1p-mapping dot1p0 3

% Error: PFC buffer-threshold policies conflict with dot1p mappings. Please
remove all dcb-buffer-threshold policies to change mappings.
```

The `show dcb` command has been enhanced to display the following additional buffer-related information:

```
 Dell (conf)#do show dcb
 dcb Status :  Enabled
 PFC Queue Count :  2 --Indicate the PFC queue configured.
 Total buffer (lossy + lossless)(in KB): 7787--Total buffer space for lossy and
lossless queues
 PFC total buffer (in KB): 6526 --Indicates the total buffer (configured or
default)
 PFC shared buffer (in KB): 832--Indicates the shared buffer (Configured or
default)
 PFC available buffer ( in KB): 5694--Indicates remaining available buffers for
PFC that are free to be allocated
```

dcb-map

Create a DCB map to configure priority flow control (PFC) and enhanced transmission selection (ETS) on Ethernet ports that support converged Ethernet traffic. Apply the DCB map to an Ethernet interface.

Syntax `dcb-map map-name`

Parameters

map-name	Enter a DCB map name. The maximum number of alphanumeric characters is 32.

Defaults None. There are no pre-configured PFC and ETS settings on S5000 Ethernet interfaces.

Command Modes CONFIGURATION

INTERFACE

Command History	**Version 9.3(0.0)**	Introduced on the FC Flex IO module installed in the M I/O Aggregator.

Usage Information

A DCB map is a template used to configure DCB parameters and apply them on converged Ethernet interfaces. DCB parameters include priority-based flow control (PFC) and enhanced traffic selection (ETS).

To display the PFC and ETS settings in DCB maps, enter the `show qos dcb-map` command.

Use the `dcb-map` command to create a DCB map to specify PFC and ETS settings and apply it on Ethernet ports. After you apply a DCB map to an interface, the PFC and ETS settings in the map are applied when the Ethernet port is enabled. DCBx is enabled on Ethernet ports by default.

The `dcb-map` command is supported only on physical Ethernet interfaces.

To remove a DCB map from an interface, enter the `no dcb-map` *`map-name`* command in Interface configuration mode.

Related Commands

show qos dcb-map– Displays the dcb-map profiles configured on the system.

dcb-map stack-unit all stack-ports all– Applies a DCB map on all ports of a switch stack.

priority-pgid

Assign 802.1p priority traffic to a priority group in a DCB map.

FC Flex IO Modules with M I/O Aggregator

Syntax

```
priority-pgid dot1p0_group-num dot1p1_group-num dot1p2_group-num dot1p3_group-num dot1p4_group-num dot1p5_group-num dot1p6_group-num dot1p7_group-num
```

Parameters

dot1p0_group-num	Enter the priority group number for each 802.1p class of traffic in a DCB map.
dot1p1_group-num	
dot1p2_group-num	
dot1p3_group-num	

dot1p4_group-num

dot1p5_group-num

dot1p6_group-num

dot1p7_group-num

Defaults None

Command Modes DCB MAP

Command History

Version 9.3(0.0)	Introduced on the FC Flex IO module installed in the M I/O Aggregator

Usage Information

PFC and ETS settings are not pre-configured on Ethernet ports. You must use the `dcb-map` command to configure different groups of 802.1p priorities with PFC and ETS settings.

Using the `priority-pgid` command, you assign each 802.1p priority to one priority group. A priority group consists of 802.1p priority values that are grouped together for similar bandwidth allocation and scheduling, and that share latency and loss requirements. All 802.1p priorities mapped to the same queue must be in the same priority group. For example, the `priority-pgid 0 0 0 1 2 4 4 4` command creates the following groups of 802.1p priority traffic:

- Priority group 0 contains traffic with dot1p priorities 0, 1, and 2.
- Priority group 1 contains traffic with dot1p priority 3.
- Priority group 2 contains traffic with dot1p priority 4.
- Priority group 4 contains traffic with dot1p priority 5, 6, and 7.

To remove a priority-pgid configuration from a DCB map, enter the `no priority-pgid` command.

Related Commands

dcb-map —Creates a DCB map to configure PFC and ETS parameters and applies the PFC and ETS settings on Ethernet ports.

priority-group bandwidth pfc— Configures the ETS bandwidth allocation and the PFC setting used to manage the port traffic in an 802.1p priority group.

priority-group bandwidth pfc

Configure the ETS bandwidth allocation and PFC mode used to manage port traffic in an 802.1p priority group.

FC Flex IO Modules with M I/O Aggregator

Syntax

```
priority-group group-num {bandwidth percentage| strict-priority} pfc {on | off}
```

Parameters

priority-group *group-num*	Enter the keyword `priority-group` followed by the number of an 802.1p priority group. Use the `priority-pgid` command to create the priority groups in a DCB map.
bandwidth *percentage*	Enter the keyword `bandwidth` followed by a bandwidth percentage allocated to the priority group. The range of valid values is 1 to 100. The sum of all allocated bandwidth percentages in priority groups in a DCB map must be 100%.
strict-priority	Configure the priority-group traffic to be handled with strict priority scheduling. Strict-priority traffic is serviced first, before bandwidth allocated to other priority groups is made available.
pfc {on | off}	Configure whether priority-based flow control is enabled (on) or disabled (off) for port traffic in the priority group.

Defaults

None

Command Modes

DCB MAP

Command History

Version 9.3(0.0)	Introduced on the FC Flex IO module installed in the M I/O Aggregator.

Usage Information

Use the `dcb-map` command to configure priority groups with PFC and/or ETS settings and apply them to Ethernet interfaces.

Use the `priority-pgid` command to map 802.1p priorities to a priority group. You can assign each 802.1p priority to only one priority group. A priority group consists of 802.1p priority values that are grouped together for similar bandwidth allocation and scheduling, and that share latency and loss requirements. All 802.1p priorities mapped to the same queue must be in the same priority group.

Repeat the `priority-group bandwidth pfc` command to configure PFC and ETS traffic handling for each priority group in a DCB map.

You can enable PFC on a maximum of two priority queues.

If you configure more than one priority group as strict priority, the higher numbered priority queue is given preference when scheduling data traffic.

If a priority group does not use its allocated bandwidth, the unused bandwidth is made available to other priority groups.

To remove a priority-group configuration in a DCB map, enter the `no priority-group bandwidth pfc` command.

By default, equal bandwidth is assigned to each dot1p priority in a priority group. Use the `bandwidth` parameter to configure the bandwidth percentage assigned to a priority group. The sum of the bandwidth allocated to all priority groups in a DCB map must be 100% of the bandwidth on the link. You must allocate at least 1% of the total port bandwidth to each priority group.

Related Commands

dcb-map – Creates a DCB map to configure PFC and ETS parameters and applies the PFC and ETS settings on Ethernet ports.

priority-pgid – Configures the 802.1p priority traffic in a priority group for a DCB map.

dcb-map stack-unit all stack-ports all

Apply the specified DCB map on all ports of the switch stack.

FC Flex IO Modules with I/O Aggregator

Syntax

`dcb-map stack-unit all stack-ports all` *`dcb-map-name`*

To remove the PFC and ETS settings in a DCB map from all stack units, use the `no dcb-map stack-unit all stack-ports all` command.

Parameters

dcb-map-name	Enter the name of the DCB map.

Defaults

None

Command Modes

CONFIGURATION

Command History

Version 9.3(0.0)	Introduced on the FC Flex IO Modules with I/O Aggregator.

Usage Information

The `dcb-map stack-unit all stack-ports all` command overwrites any previous DCB maps applied to stack ports.

Related Commands

dcb-map – creates a DCB map to configure PFC and ETS parameters and applies the PFC and ETS settings on Ethernet ports.

show qos dcb-map

Display the DCB parameters configured in a specified DCB map.

FC Flex IO Modules with M I/O Aggregator

Syntax

```
show qos dcb-map map-name
```

Parameters

map-name	Displays the PFC and ETS parameters configured in the specified map.

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 9.3(0.0)	Introduced on the FC Flex IO module installed in the M I/O Aggregator.

Usage Information

Use the `show qos dcb-map` command to display the enhanced transmission selection (ETS) and priority-based flow control (PFC) parameters used to configure server-facing Ethernet ports. S5000 Ethernet ports are DCBx-enabled by default.

The following table describes the `show qos dcb-map` output shown in the example below.

Field	Description
State	Complete: All mandatory DCB parameters are correctly configured. In progress: The DCB map configuration is not complete. Some mandatory parameters are not configured.
PFC Mode	PFC configuration in DCB map: On (enabled) or Off.
PG	Priority group configured in the DCB map.
TSA	Transmission scheduling algorithm used by the priority group: Enhanced Transmission Selection (ETS).
BW	Percentage of bandwidth allocated to the priority group.
PFC	PFC setting for the priority group: On (enabled) or Off.
Priorities	802.1p priorities configured in the priority group.

Example

```
Dell# show qos dcb-map dcbmap2

State   :Complete
PfcMode:ON
--------------------
PG:0 TSA:ETS  BW:50  PFC:OFF
Priorities:0 1 2 4 5 6 7
```

```
PG:1 TSA:ETS  BW:50  PFC:ON
Priorities:3
```

Related Commands	dcb-map — creates a DCB map to configure PFC and ETS parameters and applies the PFC and ETS settings on Ethernet ports.

DCB Command

The following DCB command is supported on the FC Flex IO module installed in the M I/O Aggregator.

dcb-enable

Enable data center bridging.

Syntax	`dcb enable` To disable DCB, use the `no dcb enable` command.
Defaults	none
Command Modes	CONFIGURATION
Command History	**Version 9.3.0.0** — Introduced on the FC Flex IO module installed in the M I/O Aggregator.
Usage Information	DCB is not supported if you enable `link-level flow control` on one or more interfaces.

DCBX Commands

The following DCBX commands are supported on the FC Flex IO module installed in the M I/O Aggregator.

advertise dcbx-appln-tlv

On a DCBX port with a manual role, configure the application priority TLVs advertised on the interface to DCBX peers.

Syntax	`advertise dcbx-appln-tlv {fcoe | iscsi}` To remove the application priority TLVs, use the `no advertise dcbx-appln-tlv {fcoe | iscsi}` command.
Parameters	**{fcoe | iscsi}** — Enter the application priority TLVs, where: • `fcoe`: enables the advertisement of FCoE in application priority TLVs. • `iscsi`: enables the advertisement of iSCSI in application priority TLVs.
Defaults	Application priority TLVs are enabled to advertise FCoE and iSCSI.

Command Modes	PROTOCOL LLDP	
Command History	**Version 9.3.0.0**	Introduced on the FC Flex IO module installed in the M I/O Aggregator and MXL 10/40GbE Switch
Usage Information	To disable TLV transmission, use the `no` form of the command; for example, `no advertise dcbx-appln-tlv iscsi`.	

advertise dcbx-tlv

On a DCBX port with a manual role, configure the PFC and ETS TLVs advertised to DCBX peers.

Syntax

`advertise dcbx-tlv {ets-conf | ets-reco | pfc} [ets-conf | ets-reco | pfc] [ets-conf | ets-reco | pfc]`

To remove the advertised ETS TLVs, use the `no advertise dcbx-tlv` command.

Parameters

{ets-conf | ets-reco | pfc} Enter the PFC and ETS TLVs advertised, where:

- `ets-conf`: enables the advertisement of ETS configuration TLVs.
- `ets-reco`: enables the advertisement of ETS recommend TLVs.
- `pfc`: enables the advertisement of PFC TLVs.

Defaults

All PFC and ETS TLVs are advertised.

Command Modes

PROTOCOL LLDP

Command History	**Version 9.3.0.0**	Introduced on the FC Flex IO module installed in the M I/O Aggregator and MXL 10/40GbE Switch

Usage Information

You can configure the transmission of more than one TLV type at a time; for example: `advertise dcbx-tlv ets-conf ets-reco`.

You can enable ETS recommend TLVs (`ets-reco`) only if you enable ETS configuration TLVs (`ets-conf`). To disable TLV transmission, use the `no` form of the command; for example, `no advertise dcbx-tlv pfc ets-reco`.

DCBX requires that you enable LLDP to advertise DCBX TLVs to peers.

Configure DCBX operation at the INTERFACE level on a switch or globally on the switch. To verify the DCBX configuration on a port, use the `show interface dcbx detail` command.

dcbx port-role

Configure the DCBX port role the interface uses to exchange DCB information.

Syntax

```
dcbx port-role {config-source | auto-downstream | auto-upstream | manual}
```

To remove DCBX port role, use the `no dcbx port-role {config-source | auto-downstream | auto-upstream | manual}` command.

Parameters

config-source | auto-downstream | auto-upstream | manual	Enter the DCBX port role, where: • `config-source`: configures the port to serve as the configuration source on the switch. • `auto-upstream`: configures the port to receive a peer configuration. The configuration source is elected from auto-upstream ports. • `auto-downstream`: configures the port to accept the internally propagated DCB configuration from a configuration source. • `manual`: configures the port to operate only on administer-configured DCB parameters. The port does not accept a DCB configuration received form a peer or a local configuration source.

Defaults **Manual**

Command Modes INTERFACE PROTOCOL LLDP

Command History

Version 9.3.0.0	Introduced on the FC Flex IO module installed in the M I/O Aggregator and MXL 10/40GbE Switch

Usage Information

DCBX requires that you enable LLDP to advertise DCBX TLVs to peers.

Configure DCBX operation at the INTERFACE level on a switch or globally on the switch. To verify the DCBX configuration on a port, use the `show interface dcbx detail` command.

dcbx version

Configure the DCBX version used on the interface.

Syntax

```
dcbx version {auto | cee | cin | ieee-v2.5}
```

To remove the DCBX version, use the `dcbx version {auto | cee | cin | ieee-v2.5}` command.

Parameters

auto | cee | cin | ieee-v2.5	Enter the DCBX version type used on the interface, where:

- `auto`: configures the port to operate using the DCBX version received from a peer.
- `cee`: configures the port to use CDD (Intel 1.01).
- `cin`: configures the port to use Cisco-Intel-Nuova (DCBX 1.0).
- `ieee-v2`: configures the port to use IEEE 802.1az (Draft 2.5).

Defaults	**Auto**	
Command Modes	INTERFACE PROTOCOL LLDP	
Command History	**Version 9.3.0.0**	Introduced on the FC Flex IO module installed in the M I/O Aggregator and MXL 10/40GbE Switch

Usage Information

DCBX requires that you enable LLDP to advertise DCBX TLVs to peers.

Configure DCBX operation at the INTERFACE level on a switch or globally on the switch. To verify the DCBX configuration on a port, use the `show interface dcbx detail` command.

debug dcbx

Enable DCBX debugging.

Syntax

```
debug dcbx {all | auto-detect-timer | config-exchng | fail | mgmt | resource | sem | tlv}
```

To disable DCBX debugging, use the `no debug dcbx` command.

Parameters

{all | auto-detect-timer | config-exchng | fail | mgmt | resource | sem | tlv}

Enter the type of debugging, where:

- `all`: enables all DCBX debugging operations.
- `auto-detect-timer`: enables traces for DCBX auto-detect timers.
- `config-exchng`: enables traces for DCBX configuration exchanges.
- `fail`: enables traces for DCBX failures.
- `mgmt`: enables traces for DCBX management frames.
- `resource`: enables traces for DCBX system resource frames.
- `sem`: enables traces for the DCBX state machine.
- `tlv`: enables traces for DCBX TLVs.

Defaults none

Command Modes	EXEC Privilege	
Command History	**Version 9.3.0.0**	Introduced on the FC Flex IO module installed in the M I/O Aggregator and MXL 10/40GbE Switch

fcoe priority-bits

Configure the FCoE priority advertised for the FCoE protocol in application priority TLVs.

Syntax	`fcoe priority-bits` *priority-bitmap* To remove the configured FCoE priority, use the `no fcoe priority-bits` command.	
Parameters	***priority-bitmap***	Enter the priority-bitmap range. The range is from 1 to FF.
Defaults	0x8	
Command Modes	PROTOCOL LLDP	
Command History	**Version 9.3.0.0**	Introduced on the FC Flex IO module installed in the M I/O Aggregator and MXL 10/40GbE Switch
Usage Information	This command is available at the global level only.	

iscsi priority-bits

Configure the iSCSI priority advertised for the iSCSI protocol in application priority TLVs.

Syntax	`iscsi priority-bits` *priority-bitmap* To remove the configured iSCSI priority, use the `no iscsi priority-bits` command.	
Parameters	***priority-bitmap***	Enter the priority-bitmap range. The range is from 1 to FF.
Defaults	0x10	
Command Modes	PROTOCOL LLDP	
Command History	**Version 9.3.0.0**	Introduced on the FC Flex IO module installed in the M I/O Aggregator and MXL 10/40GbE Switch
Usage Information	This command is available at the global level only.	

show interface dcbx detail

Displays the DCBX configuration on an interface.

Syntax

```
show interface port-type slot/port dcbx detail
```

Parameters

port-type	Enter the port type.
slot/port	Enter the slot/port number.

Command Modes

CONFIGURATION

Command History

Version 9.3.0.0	Introduced on the FC Flex IO module installed in the M I/O Aggregator and MXL 10/40GbE Switch.

Usage Information

To clear DCBX frame counters, use the `clear dcbx counters interface stack-unit/port` command.

The following describes the `show interface dcbx detail` command shown in the following example.

Field	Description
Interface	Interface type with chassis slot and port number.
Port-Role	Configured the DCBX port role: auto-upstream, auto-downstream, config-source, or manual.
DCBX Operational Status	Operational status (enabled or disabled) used to elect a configuration source and internally propagate a DCB configuration. The DCBX operational status is the combination of PFC and ETS operational status.
Configuration Source	Specifies whether the port serves as the DCBX configuration source on the switch: true (yes) or false (no).
Local DCBX Compatibility mode	DCBX version accepted in a DCB configuration as compatible. In auto-upstream mode, a port can only receive a DCBX version supported on the remote peer.
Local DCBX Configured mode	DCBX version configured on the port: CEE, CIN, IEEE v2.5, or Auto (port auto-configures to use the DCBX version received from a peer).
Peer Operating version	DCBX version that the peer uses to exchange DCB parameters.
Local DCBX TLVs Transmitted	Transmission status (enabled or disabled) of advertised DCB TLVs (see TLV code at the top of the show command output).
Local DCBX Status: DCBX	DCBX version advertised in Control TLVs.

Field	Description
Operational Version	
Local DCBX Status: DCBX Max Version Supported	Highest DCBX version supported in Control TLVs.
Local DCBX Status: Sequence Number	Sequence number transmitted in Control TLVs.
Local DCBX Status: Acknowledgment Number	Acknowledgement number transmitted in Control TLVs.
Local DCBX Status: Protocol State	Current operational state of the DCBX protocol: ACK or IN-SYNC.
Peer DCBX Status: DCBX Operational Version	DCBX version advertised in Control TLVs received from the peer device.
Peer DCBX Status: DCBX Max Version Supported	Highest DCBX version supported in Control TLVs received from the peer device.
Peer DCBX Status: Sequence Number	Sequence number transmitted in Control TLVs received from the peer device.
Peer DCBX Status: Acknowledgment Number	Acknowledgement number transmitted in Control TLVs received from the peer device.
Total DCBX Frames transmitted	Number of DCBX frames sent from the local port.
Total DCBX Frames received	Number of DCBX frames received from the remote peer port.
Total DCBX Frame errors	Number of DCBX frames with errors received.
Total DCBX Frames unrecognized	Number of unrecognizable DCBX frames received.

Example

```
Dell(conf)# show interface tengigabitethernet 0/49 dcbx detail
Dell#show interface te 0/49 dcbx detail

E-ETS Configuration TLV enabled
  e-ETS Configuration TLV disabled
R-ETS Recommendation TLV enabled
```

```
  r-ETS Recommendation TLV disabled
P-PFC Configuration TLV enabled
  p-PFC Configuration TLV disabled
F-Application priority for FCOE enabled
  f-Application Priority for FCOE disabled
I-Application priority for iSCSI enabled
  i-Application Priority for iSCSI disabled
---------------------------------------------------------

Interface TenGigabitEthernet 0/49
  Remote Mac Address 00:00:00:00:00:11
   Port Role is Auto-Upstream
  DCBX Operational Status is Enabled
  Is Configuration Source? TRUE

Local DCBX Compatibility mode is CEE
  Local DCBX Configured mode is CEE
  Peer Operating version is CEE
  Local DCBX TLVs Transmitted: ErPfi

Local DCBX Status
-----------------
  DCBX Operational Version is 0
  DCBX Max Version Supported is 0
  Sequence Number: 2
  Acknowledgment Number: 2
  Protocol State: In-Sync

Peer DCBX Status:
----------------
  DCBX Operational Version is 0
  DCBX Max Version Supported is 255
  Sequence Number: 2
  Acknowledgment Number: 2
  Total DCBX Frames transmitted 27
  Total DCBX Frames received 6
  Total DCBX Frame errors 0
  Total DCBX Frames unrecognized 0
```

ETS Commands

The following ETS commands are supported on the FC Flex IO module installed in the M I/O Aggregator.

clear ets counters

Clear all ETS TLV counters on an interface.

Syntax	`clear ets counters port-type slot/port`	
Parameters	**port-type**	Enter the keywords `port-type` then the slot/port information.
Defaults	none	
Command Modes	EXEC Privilege	
Command History	**Version 9.3.0.0**	Introduced on the FC Flex IO module installed in the M I/O Aggregator and MXL 10/40GbE Switch.

show interface ets

Displays the ETS configuration applied to egress traffic on an interface, including priority groups with priorities and bandwidth allocation.

Syntax

```
show interface port-type slot/port ets {summary | detail}
```

Parameters

port-type slot/port ets	Enter the port-type slot and port ETS information.
{summary | detail}	Enter the keyword `summary` for a summary list of results or enter the keyword `detail` for a full list of results.

Command Modes

CONFIGURATION

Command History

Version 9.3.0.0	Introduced on the FC Flex IO module installed in the M I/O Aggregator and MXL 10/40GbE Switch.

Usage Information

To clear ETS TLV counters, use the `clear ets counters interface port-type slot/port` command.

The following describes the `show interface summary` command shown in the following example.

Field	Description
Interface	Interface type with stack-unit and port number.
Max Supported TC Group	Maximum number of priority groups supported.
Number of Traffic Classes	Number of 802.1p priorities currently configured.
Admin mode	ETS mode: on or off. When on, the scheduling and bandwidth allocation configured in an ETS output policy or received in a DCBX TLV from a peer can take effect on an interface.
Admin Parameters	ETS configuration on local port, including priority groups, assigned dot1p priorities, and bandwidth allocation.
Remote Parameters	ETS configuration on remote peer port, including admin mode (enabled if a valid TLV was received or disabled), priority groups, assigned dot1p priorities, and bandwidth allocation. If ETS admin mode is enabled on the remote port for DCBX exchange, the Willing bit received in ETS TLVs from the remote peer is included.
Local Parameters	ETS configuration on local port, including admin mode (enabled when a valid TLV is received from a peer), priority groups, assigned dot1p priorities, and bandwidth allocation.

Field	Description
Operational status (local port)	Port state for current operational ETS configuration: • `Init`: Local ETS configuration parameters were exchanged with the peer. • `Recommend`: Remote ETS configuration parameters were received from the peer. • `Internally propagated`: ETS configuration parameters were received from the configuration source.
ETS DCBX Oper status	Operational status of the ETS configuration on the local port: match or mismatch.
State Machine Type	Type of state machine used for DCBX exchanges of ETS parameters: Feature — for legacy DCBX versions; Asymmetric — for an IEEE version.
Conf TLV Tx Status	Status of ETS Configuration TLV advertisements: enabled or disabled.
Reco TLV Tx Status	Status of ETS Recommendation TLV advertisements: enabled or disabled.
Input Conf TLV pkts	Number of ETS Configuration TLVs received.
Output Conf TLV pkts	Number of ETS Configuration TLVs transmitted.
Error Conf TLV pkts	Number of ETS Error Configuration TLVs received.
Input Reco TLV pkts	Number of ETS Recommendation TLVs received.
Output Reco TLV pkts	Number of ETS Recommendation TLVs transmitted.
Error Reco TLV pkts	Number of ETS Error Recommendation TLVs received.

Example (Summary)

```
Dell(conf)# show interfaces te 0/0 ets summary
Interface TenGigabitEthernet 0/0
Max Supported TC Groups is 4
Number of Traffic Classes is 8
Admin mode is on
Admin Parameters:
------------------
Admin is enabled
TC-grp Priority#        Bandwidth TSA
0      0,1,2,3,4,5,6,7  100%      ETS
1                         0%      ETS
2                         0%      ETS
3                         0%      ETS
4                         0%      ETS
```

```
5                          0%      ETS
6                          0%      ETS
7                          0%      ETS
Priority#               Bandwidth  TSA
0                          13%     ETS
1                          13%     ETS
2                          13%     ETS
3                          13%     ETS
4                          12%     ETS
5                          12%     ETS
6                          12%     ETS
7                          12%     ETS
Remote Parameters:
-------------------
Remote is disabled
Local Parameters:
------------------
Local is enabled
TC-grp Priority#         Bandwidth TSA
0      0,1,2,3,4,5,6,7   100%      ETS
1                          0%      ETS
2                          0%      ETS
3                          0%      ETS
4                          0%      ETS
5                          0%      ETS
6                          0%      ETS
7                          0%      ETS
Priority#                Bandwidth TSA
0                          13%     ETS
1                          13%     ETS
2                          13%     ETS
3                          13%     ETS
4                          12%     ETS
5                          12%     ETS
6                          12%     ETS
7                          12%     ETS
Oper status is init
Conf TLV Tx Status is disabled
Traffic Class TLV Tx Status is disabled
```

Example (Detail)

```
Dell(conf)# show interfaces tengigabitethernet 0/0 ets detail
Interface TenGigabitEthernet 0/0
Max Supported TC Groups is 4
Number of Traffic Classes is 8
Admin mode is on
Admin Parameters :
------------------
Admin is enabled
TC-grp Priority#         Bandwidth TSA
0      0,1,2,3,4,5,6,7   100%      ETS
1                        0%        ETS
2                        0%        ETS
3                        0%        ETS
4                        0%        ETS
5                        0%        ETS
6                        0%        ETS
7                        0%        ETS

Priority#                Bandwidth TSA
0                        13%       ETS
1                        13%       ETS
2                        13%       ETS
3                        13%       ETS
```

```
4                       12%       ETS
5                       12%       ETS
6                       12%       ETS
7                       12%       ETS
Remote Parameters:
-------------------
Remote is disabled

Local Parameters :
------------------
Local is enabled
TC-grp Priority#        Bandwidth TSA
0      0,1,2,3,4,5,6,7  100%      ETS
1                       0%        ETS
2                       0%        ETS
3                       0%        ETS
4                       0%        ETS
5                       0%        ETS
6                       0%        ETS
7                       0%        ETS

Priority#               Bandwidth TSA
0                       13%       ETS
1                       13%       ETS
2                       13%       ETS
3                       13%       ETS
4                       12%       ETS
5                       12%       ETS
6                       12%       ETS
7                       12%       ETS
Oper status is init
Conf TLV Tx Status is disabled
Traffic Class TLV Tx Status is disabled
0 Input Conf TLV Pkts, 0 Output Conf TLV Pkts, 0 Error Conf
TLV Pkts
0 Input Traffic Class TLV Pkts, 0 Output Traffic Class TLV
Pkts, 0 Error Traffic Class
TLV
Pkts
```

show stack-unit stack-ports ets details

Displays the ETS configuration applied to egress traffic on stacked ports, including ETS Operational mode on each unit and the configurated priority groups with dot1p priorities, bandwidth allocation, and scheduler type.

Syntax

```
show stack-unit {all | stack-unit} stack-ports {all | port-number} ets details
```

Parameters

stack-unit	Enter the stack unit identification.
port-number	Enter the port number.

Command Modes

CONFIGURATION

Command History

Version 9.3.0.0	Introduced on the FC Flex IO module installed in the M I/O Aggregator and MXL 10/40GbE Switch.

Example

```
Dell(conf)# show stack-unit all stack-ports all ets details

Stack unit 0 stack port all
Max Supported TC Groups is 4
Number of Traffic Classes is 1
Admin mode is on

Admin Parameters:
-------------------
Admin is enabled
TC-grp Priority#        Bandwidth TSA
-----------------------------------------------
0      0,1,2,3,4,5,6,7  100%      ETS
1                       - -
2                       - -
3                       - -
4                       - -
5                       - -
6                       - -
7                       - -
8                       - -

Stack unit 1 stack port all
Max Supported TC Groups is 4
Number of Traffic Classes is 1
Admin mode is on
Admin Parameters:
-------------------
Admin is enabled
TC-grp Priority#        Bandwidth TSA
-----------------------------------------------
0      0,1,2,3,4,5,6,7  100%      ETS
1                       -         -
2                       -         -
3                       -         -
4                       -         -
5                       -         -
6                       -         -
7                       -         -
8                       -         -
```

PFC Commands

The following PFC commands are supported on the FC Flex IO module installed in the M I/O Aggregator.

clear pfc counters

Clear the PFC TLV counters and PFC statistics on an interface or stack unit.

Syntax

```
clear pfc counters [port-type slot/port | stack-unit {unit
number | all } all stack-ports all}] | interface {statistics}]
```

Parameters

port-type	Enter the keywords `port-type` then the slot/port information.
stack-unit *unit number*	Enter the keywords `stack-unit` then the stack-unit number to be cleared.
all stack-ports all	Enter the keywords `all stack-ports all` to clear the counters on all interfaces.

	statistics	Enter the keyword `statistics` to clear only the hardware PFC counters.

Defaults	none	
Command Modes	EXEC Privilege	
Command History	**Version 9.3.0.0**	Introduced on the FC Flex IO module installed in the M I/O Aggregator and MXL 10/40GbE Switch.
Usage Information	If you do not use the `statistics` parameter, both hardware and DCBx counters clear.	

show dcb

Displays the data center bridging status, the number of PFC-enabled ports, and the number of PFC-enabled queues.

Syntax	`show dcb [stack-unit` *`unit-number`*`]`	
Parameters	***unit number***	Enter the DCB unit number. The range is from 0 to 5.
Command Modes	EXEC Privilege	
Command History	**Version 9.3.0.0**	Introduced on the FC Flex IO module installed in the M I/O Aggregator and MXL 10/40GbE Switch.
Usage Information	Specify a stack-unit number on the Master switch in a stack.	

Example

```
Dell# show dcb
stack-unit 0 port-set 0
      DCB Status : Enabled
    PFC Port Count : 56 (current), 56 (configured)
PFC Queue Count : 2 (current), 2 (configured)
```

show interface pfc

Displays the PFC configuration applied to ingress traffic on an interface, including priorities and link delay.

Syntax	`show interface` *`port-type slot/port pfc`* `{summary | detail}`	
Parameters	***port-type slot/ port pfc***	Enter the port-type slot and port PFC information.
	{summary | detail}	Enter the keyword `summary` for a summary list of results or enter the keyword `detail` for a full list of results.
Command Modes	INTERFACE	

Command History		
	Version 9.3.0.0	Introduced on the FC Flex IO module installed in the M I/O Aggregator and MXL 10/40GbE Switch.

Usage Information

To clear the PFC TLV counters, use the `clear pfc counters interface` *`port-type slot/port`* command.

The following describes the `show interface pfc summary` command shown in the following example.

Field	Description
Interface	Interface type with stack-unit and port number.
Admin mode is on Admin is enabled	PFC admin mode is on or off with a list of the configured PFC priorities. When the PFC admin mode is on, PFC advertisements are enabled to be sent and received from peers; received PFC configuration take effect. The admin operational status for a DCBX exchange of PFC configuration is enabled or disabled.
Remote is enabled, Priority list Remote Willing Status is enabled	Operational status (enabled or disabled) of peer device for DCBX exchange of PFC configuration with a list of the configured PFC priorities. Willing status of peer device for DCBX exchange (Willing bit received in PFC TLV): enabled or disable.
Local is enabled	DCBX operational status (enabled or disabled) with a list of the configured PFC priorities.
Operational status (local port)	Port state for current operational PFC configuration: • `Init`: Local PFC configuration parameters were exchanged with the peer. • `Recommend`: Remote PFC configuration parameters were received from the peer. • `Internally propagated`: PFC configuration parameters were received from the configuration source.
PFC DCBX Oper status	Operational status for the exchange of the PFC configuration on the local port: match (up) or mismatch (down).
State Machine Type	Type of state machine used for DCBX exchanges of the PFC parameters: Feature — for legacy DCBX versions; Symmetric — for an IEEE version.
TLV Tx Status	Status of the PFC TLV advertisements: enabled or disabled.
PFC Link Delay	Link delay (in quanta) used to pause specified priority traffic.

Field	Description
Application Priority TLV: FCOE TLV Tx Status	Status of FCoE advertisements in application priority TLVs from the local DCBX port: enabled or disabled.
Application Priority TLV: SCSI TLV Tx Status	Status of ISCSI advertisements in application priority TLVs from the local DCBX port: enabled or disabled.
Application Priority TLV: Local FCOE Priority Map	Priority bitmap the local DCBX port uses in FCoE advertisements in application priority TLVs.
Application Priority TLV: Local ISCSI Priority Map	Priority bitmap the local DCBX port uses in ISCSI advertisements in application priority TLVs.
Application Priority TLV: Remote FCOE Priority Map	Status of FCoE advertisements in application priority TLVs from the remote peer port: enabled or disabled.
Application Priority TLV: Remote ISCSI Priority Map	Status of iSCSI advertisements in application priority TLVs from the remote peer port: enabled or disabled.
PFC TLV Statistics: Input TLV pkts	Number of PFC TLVs received.
PFC TLV Statistics: Output TLV pkts	Number of PFC TLVs transmitted.
PFC TLV Statistics: Error pkts	Number of PFC error packets received.
PFC TLV Statistics: Pause Tx pkts	Number of PFC pause frames transmitted.
PFC TLV Statistics: Pause Rx pkts	Number of PFC pause frames received.

Example (Summary)

```
Dell# show interfaces tengigabitethernet 0/49 pfc summary
Interface TenGigabitEthernet 0/49
  Admin mode is on
  Admin is enabled
  Remote is enabled, Priority list is 4
  Remote Willing Status is enabled
  Local is enabled
  Oper status is Recommended
  PFC DCBX Oper status is Up
  State Machine Type is Feature
  TLV Tx Status is enabled
  PFC Link Delay 45556 pause quantams
  Application Priority TLV Parameters :
  ---------------------------------------
  FCOE TLV Tx Status is disabled
```

```
  ISCSI TLV Tx Status is disabled
  Local FCOE PriorityMap is 0x8
  Local ISCSI PriorityMap is 0x10
  Remote FCOE PriorityMap is 0x8
  Remote ISCSI PriorityMap is 0x8

Dell# show interfaces tengigabitethernet 0/49 pfc detail
  Interface TenGigabitEthernet 0/49
  Admin mode is on
  Admin is enabled
  Remote is enabled
  Remote Willing Status is enabled
  Local is enabled
  Oper status is recommended
  PFC DCBX Oper status is Up
  State Machine Type is Feature
  TLV Tx Status is enabled
  PFC Link Delay 45556 pause quanta
  Application Priority TLV Parameters :
  ------------------------------------
  FCOE TLV Tx Status is disabled
  ISCSI TLV Tx Status is disabled
  Local FCOE PriorityMap is 0x8
  Local ISCSI PriorityMap is 0x10
  Remote FCOE PriorityMap is 0x8
  Remote ISCSI PriorityMap is 0x8
  0 Input TLV pkts, 1 Output TLV pkts, 0 Error pkts,
  0 Pause Tx pkts, 0 Pause Rx pkts
```

show interface pfc statistics

Displays counters for the PFC frames received and transmitted (by dot1p priority class) on an interface.

Syntax

```
show interface port-type slot/port pfc statistics
```

Parameters

port-type	Enter the port type.
slot/port	Enter the slot/port number.

Command Modes

INTERFACE

Command History

Version 9.3.0.0	Introduced on the FC Flex IO module installed in the M I/O Aggregator and MXL 10/40GbE Switch.

Example (Summary)

```
Dell#show interfaces te 0/3 pfc statistics
Interface TenGigabitEthernet 0/3

Priority Rx XOFF Frames Rx Total Frames Tx Total Frames
-----------------------------------------------------------
0        0              0               0
1        0              0               0
2        0              0               0
3        0              0               0
4        0              0               0
5        0              0               0
6        0              0               0
7        0              0               0
```

show stack-unit stack-ports pfc details

Displays the PFC configuration applied to ingress traffic on stacked ports, including PFC Operational mode on each unit with the configured priorities, link delay, and number of pause packets sent and received.

Syntax

```
show stack-unit {all | stack-unit} stack-ports {all | port-number} pfc details
```

Parameters

stack-unit	Enter the stack unit.
port-number	Enter the port number.

Command Modes

CONFIGURATION

Command History

Version 9.3.0.0	Introduced on the FC Flex IO module installed in the M I/O Aggregator and MXL 10/40GbE Switch.

Example

```
Dell(conf)# show stack-unit all stack-ports all pfc details

stack unit 0 stack-port all
  Admin mode is On
  Admin is enabled, Priority list is 4-5
  Local is enabled, Priority list is 4-5
  Link Delay 45556 pause quantum
  0 Pause Tx pkts, 0 Pause Rx pkts

stack unit 1 stack-port all
  Admin mode is On
  Admin is enabled, Priority list is 4-5
  Local is enabled, Priority list is 4-5
  Link Delay 45556 pause quantum
  0 Pause Tx pkts, 0 Pause Rx pkts
```

Fibre Channel over Ethernet for FC Flex IO Modules

FCoE provides a converged Ethernet network that allows the combination of storage-area network (SAN) and LAN traffic on a Layer 2 link by encapsulating Fibre Channel data into Ethernet frames.

The Fibre Channel (FC) Flex IO module is supported on Dell Networking Operating System (OS) MXL 10/40GbE Switch and M I/O Aggregator (IOA). The MXL and IOA switch installed with the FC Flex IO module functions as a top-of-rack edge switch that supports converged enhanced Ethernet (CEE) traffic — Fibre channel over Ethernet (FCoE) for storage, Interprocess Communication (IPC) for servers, and Ethernet local area network (LAN) (IP cloud) for data — as well as FC links to one or more storage area network (SAN) fabrics.

FCoE works with the Ethernet enhancements provided in Data Center Bridging (DCB) to support lossless (no-drop) SAN and LAN traffic. In addition, DCB provides flexible bandwidth sharing for different traffic types, such as LAN and SAN, according to 802.1p priority classes of service. DCBx should be enabled on the system before the FIP snooping feature is enabled.

All of the commands that are supported for FCoE on the MXL and I/O Aggregator apply to the FC Flex IO modules. Similarly, all of the configuration procedures and the settings that are applicable for FCoE on the MXL and I/O Aggregator are valid for the FC Flex IO modules.

NPIV Proxy Gateway for FC Flex IO Modules

The N-port identifier virtualization (NPIV) Proxy Gateway (NPG) feature provides FCoE-FC bridging capability on the M I/O Aggregator and MXL 10/40GbE Switch with the FC Flex IO module switch, allowing server CNAs to communicate with SAN fabrics over the M I/O Aggregator and MXL 10/40GbE Switch with the FC Flex IO module.

To configure the M I/O Aggregator and MXL 10/40GbE Switch with the FC Flex IO module to operate as an NPIV proxy gateway, use the following commands:

show fcoe-map

Display the Fibre Channel and FCoE configuration parameters in FCoE maps.

M I/O Aggregator and MXL 10/40GbE Switch with the FC Flex IO module

Syntax

```
show fcoe-map [brief | map-name]
```

Parameters

brief	Displays an overview of currently configured FCoE maps.
map-name	Displays the FC and FCoE configuration parameters in a specified FCoE map. The FCoE map is applied on Ethernet (FCoE) and FC ports to transmit FC storage traffic to a specified fabric.

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 9.3(0.0)	Introduced on the M I/O Aggregator and MXL 10/40GbE Switch with the FC Flex IO module.

Usage Information

Use the `show fcoe-map` command to display the FC and FCoE parameters used to configure server-facing Ethernet (FCoE) and fabric-facing FC ports in all FCoE maps on an M I/O Aggregator and MXL 10/40GbE Switch with the FC Flex IO module NPIV proxy gateway.

In each FCoE map, the values for the fabric ID and FC-MAP that identify the SAN fabric to which FC storage traffic is sent, and the FCoE VLAN to be used must be unique.

An FCoE map is used to identify the SAN fabric to which FCoE storage traffic is sent and to virtualize M I/O Aggregator and MXL 10/40GbE Switch with the FC Flex IO module FC ports so that they appear to downstream server CNA ports as FCoE Forwarder (FCF) ports on an FCoE network.

The following table describes the `show fcoe-map brief` output shown in the example below.

Field	Description
Fabric-Name	Name of a SAN fabric.

Field	Description
Fabric ID	The ID number of the SAN fabric to which FC traffic is forwarded.
VLAN ID	The dedicated FCoE VLAN used to transport FCoE storage traffic between servers and a fabric over the NPIV proxy gateway. The configured VLAN ID must be the same as the fabric ID.
FC-MAP	FCoE MAC address-prefix value - The unique 24-bit MAC address prefix that identifies a fabric.
FCF Priority	The priority used by a server to select an upstream FCoE forwarder.
Config-State	Indicates whether the configured FCoE and FC parameters in the FCoE map are valid: Active (all mandatory FCoE and FC parameters are correctly configured) or Incomplete (either the FC-MAP value, fabric ID, or VLAN ID are not correctly configured).
Oper-State	Operational status of link to the fabric: Up (link is up and transmitting FC traffic), Down (link is down and not transmitting FC traffic), Link-wait (link is up and waiting for FLOGI to complete on peer FC port), or Removed (port has been shut down).

The following table describes the `show fcoe-map` *`map-name`* output shown in the example below.

Field	Description
Fabric-Name	Name of a SAN fabric.
Fabric ID	The ID number of the SAN fabric to which FC traffic is forwarded.
VLAN ID	The dedicated FCoE VLAN used to transport FCoE storage traffic between servers and a fabric over the NPIV proxy gateway. The configured VLAN ID must be the same as the fabric ID.
VLAN priority	FCoE traffic uses VLAN priority 3. (This setting is not user-configurable.)
FC-MAP	FCoE MAC address-prefix value - The unique 24-bit MAC address prefix that identifies a fabric.
FKA-ADV-period	Time interval (in seconds) used to transmit FIP keepalive advertisements.
FCF Priority	The priority used by a server to select an upstream FCoE forwarder.
Config-State	Indicates whether the configured FCoE and FC parameters in the FCoE map are valid: Active (all mandatory FCoE and

Field	Description
	FC parameters are correctly configured) or Incomplete (either the FC-MAP value, fabric ID, or VLAN ID are not correctly configured).
Oper-State	Operational status of link to the fabric: Up (link is up and transmitting FC traffic), Down (link is down and not transmitting FC traffic), Link-wait (link is up and waiting for FLOGI to complete on peer FC port), or Removed (port has been shut down).
Members	M I/O Aggregator and MXL 10/40GbE Switch with the FC Flex IO module Ethernet and FC ports that are members of the dedicated FCoE VLAN that carries storage traffic to the specified fabric.

Example

```
Dell#show fcoe-map brief
Fabric-Name  Fabric-Id  Vlan-Id  FC-MAP  FCF-Priority Config-
State Oper-State
 test        16          16      0efc02  128
ACTIVE        UP
 cnatest     1003           1003    0efc03  128
ACTIVE        UP
 sitest      1004        1004    0efc04  128
ACTIVE        DOWN


Dell#show fcoe-map si

Fabric Name         si
Fabric Id           1004
Vlan Id             1004
Vlan priority       3
FC-MAP              0efc04
FKA-ADV-Period      8
Fcf Priority        128
Config-State        ACTIVE
Oper-State          DOWN
Members
```

Related Commands

fcoe-map — creates an FCoE map which contains the parameters used in the communication between servers and a SAN fabric.

show npiv devices

Display the FCoE and FC devices currently logged in to an M I/O Aggregator and MXL 10/40GbE Switch with the FC Flex IO module NPIV proxy gateway.

M I/O Aggregator and MXL 10/40GbE Switch with the FC Flex IO module

Syntax

```
show npiv devices [brief]
```

Parameters

brief	Displays an overview of current server CNA-fabric connections over an M I/O Aggregator and MXL 10/40GbE Switch with the FC Flex IO module NPIV proxy gateway.

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 9.3(0.0)	Introduced on the M I/O Aggregator and MXL 10/40GbE Switch with the FC Flex IO module.

Usage Information

Use the `show npiv devices` command to display information on the server CNA, server-facing Ethernet and fabric-facing FC ports, and the SAN fabric in each server-fabric connection over an M I/O Aggregator and MXL 10/40GbE Switch with the FC Flex IO module NPIV proxy gateway.

The following table describes the `show npiv devices brief` output shown in the example below.

Field	Description
ENode-Intf	M I/O Aggregator and MXL 10/40GbE Switch with the FC Flex IO module Ethernet interface (*slot/port*) to which a server CNA is connected.
ENode-WWPN	Worldwide port name (WWPN) of a server CNA port.
FCoE-Vlan	VLAN ID of the dedicated VLAN used to transmit FCoE traffic to and from the fabric.
Fabric-Intf	Fabric-facing Fibre Channel port (*slot/port*) on which FC traffic is transmitted to the specified fabric.
Fabric-Map	Name of the FCoE map containing the FCoE/FC configuration parameters for the server CNA-fabric connection.
LoginMethod	Method used by the server CNA to log in to the fabric; for example: FLOGI - ENode logged in using a fabric login (FLOGI). FDISC - ENode logged in using a fabric discovery (FDISC).
Status	Operational status of the link between a server CNA port and a SAN fabric: Logged In - Server has logged in to the fabric and is able to transmit FCoE traffic.

Example

```
Dell# show npiv devices brief

Total NPIV Devices = 2
-------------------------------------------------------------------
---------------------------

ENode-Intf  ENode-WWPN           FCoE-Vlan  Fabric-Intf
Fabric-Map   LoginMethod  Status
-------------------------------------------------------------------
--------------------------
```

```
Te 0/12     20:01:00:10:18:f1:94:20   1003      Fc 0/5
fid_1003     FLOGI       LOGGED_IN
Te 0/13     10:00:00:00:c9:d9:9c:cb   1003      Fc 0/0
fid_1003     FDISC       LOGGED_IN
```

Usage Information

The following table describes the `show npiv devices` output shown in the example below.

Field	Description
ENode [*number*]	A server CNA that has successfully logged in to a fabric over an M I/O Aggregator and MXL 10/40GbE Switch with the FC Flex IO module Ethernet port in ENode mode.
Enode MAC	MAC address of a server CNA port.
Enode Intf	Port number of a server-facing Ethernet port operating in ENode mode.
FCF MAC	Fibre Channel forwarder MAC: MAC address of M I/O Aggregator and MXL 10/40GbE Switch with the FC Flex IO module FCF interface.
Fabric Intf	Fabric-facing Fibre Channel port (*slot/port*) on which FCoE traffic is transmitted to the specified fabric.
FCoE VLAN	ID of the dedicated VLAN used to transmit FCoE traffic from a server CNA to a fabric and configured on both the server-facing M I/O Aggregator and MXL 10/40GbE Switch with the FC Flex IO module port and server CNA port.
Fabric Map	Name of the FCoE map containing the FCoE/FC configuration parameters for the server CNA-fabric connection.
Enode WWPN	Worldwide port name of the server CNA port.
Enode WWNN	Worldwide node name of the server CNA.
FCoE MAC	Fabric-provided MAC address (FPMA). The FPMA consists of the FC-MAP value in the FCoE map and the FC-ID provided by the fabric after a successful FLOGI. In the FPMA, the most significant bytes are the FC-MAP; the least significant bytes are the FC-ID.
FC-ID	FC port ID provided by the fabric.
LoginMethod	Method used by the server CNA to log in to the fabric; for example, FLOGI or FDISC.
Secs	Number of seconds that the fabric connection is up.
State	Status of the fabric connection: logged in.

Example

```
ENode[0]:
ENode MAC    :     00:10:18:f1:94:21
ENode Intf   :     Te 0/12
FCF MAC      :     5c:f9:dd:ef:10:c8
Fabric Intf  :     Fc 0/5
```

```
FCoE Vlan     :     1003
Fabric Map    :     fid_1003
ENode WWPN    :     20:01:00:10:18:f1:94:20
ENode WWNN    :     20:00:00:10:18:f1:94:21
FCoE MAC      :     0e:fc:03:01:02:01
FC-ID         :     01:02:01
LoginMethod   :     FLOGI
Secs          :     5593
Status        :     LOGGED_IN

ENode[1]:
ENode MAC     :     00:10:18:f1:94:22
ENode Intf    :     Te 0/13
FCF MAC       :     5c:f9:dd:ef:10:c9
Fabric Intf   :     Fc 0/0
FCoE Vlan     :     1003
Fabric Map    :     fid_1003
ENode WWPN    :     10:00:00:00:c9:d9:9c:cb
ENode WWNN    :     10:00:00:00:c9:d9:9c:cd
FCoE MAC      :     0e:fc:03:01:02:02
FC-ID         :     01:02:01
LoginMethod   :     FDISC
Secs          :     5593
Status        :     LOGGED_IN
```

Related Commands

dcb-map— creates a DCB map to configure DCB parameters on Ethernet ports that support converged Ethernet traffic.

fcoe-map — creates an FCoE map which contains the parameters used in the communication between servers and a SAN fabric.

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PMUX Mode of the I/O Aggregator

This chapter describes the various CLI commands applicable in PMUX mode.

Data Center Bridging (DCB)

Data center bridging (DCB) refers to a set of IEEE Ethernet enhancements that provide data centers with a single, robust, converged network to support multiple traffic types, including local area network (LAN), server, and storage traffic.

The Dell Networking Operating System (OS) commands for data center bridging features include 802.1Qbb priority-based flow control (PFC), 802.1Qaz enhanced transmission selection (ETS), and the data center bridging exchange (DCBX) protocol.

advertise dcbx-appln-tlv

On a DCBX port with a manual role, configure the application priority TLVs advertised on the interface to DCBX peers.

Syntax

`advertise dcbx-appln-tlv {fcoe | iscsi}`

To remove the application priority TLVs, use the `no advertise dcbx-appln-tlv {fcoe | iscsi}` command.

Parameters

{fcoe | iscsi} Enter the application priority TLVs, where:

- `fcoe`: enables the advertisement of FCoE in application priority TLVs.
- `iscsi`: enables the advertisement of iSCSI in application priority TLVs.

Defaults

Application priority TLVs are enabled to advertise FCoE and iSCSI.

Command Modes

PROTOCOL LLDP

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information

To disable TLV transmission, use the `no` form of the command; for example, `no advertise dcbx-appln-tlv iscsi`.

advertise dcbx-tlv

On a DCBX port with a manual role, configure the PFC and ETS TLVs advertised to DCBX peers.

Syntax

`advertise dcbx-tlv {ets-conf | ets-reco | pfc} [ets-conf | ets-reco | pfc] [ets-conf | ets-reco | pfc]`

To remove the advertised ETS TLVs, use the `no advertise dcbx-tlv` command.

Parameters

{ets-conf | ets-reco | pfc} Enter the PFC and ETS TLVs advertised, where:

- `ets-conf`: enables the advertisement of ETS configuration TLVs.
- `ets-reco`: enables the advertisement of ETS recommend TLVs.
- `pfc`: enables the advertisement of PFC TLVs.

Defaults

All PFC and ETS TLVs are advertised.

Command Modes

PROTOCOL LLDP

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information

You can configure the transmission of more than one TLV type at a time; for example: `advertise dcbx-tlv ets-conf ets-reco`.

You can enable ETS recommend TLVs (`ets-reco`) only if you enable ETS configuration TLVs (`ets-conf`). To disable TLV transmission, use the `no` form of the command; for example, `no advertise dcbx-tlv pfc ets-reco`.

DCBX requires that you enable LLDP to advertise DCBX TLVs to peers.

Configure DCBX operation at the INTERFACE level on a switch or globally on the switch. To verify the DCBX configuration on a port, use the `show interface dcbx detail` command.

bandwidth-percentage

Configure the bandwidth percentage allocated to priority traffic in port queues.

Syntax

`bandwidth-percentage` *`percentage`*

To remove the configured bandwidth percentage, use the `no bandwidth-percentage` command.

Parameters	*percentage*	(Optional) Enter the bandwidth percentage. The percentage range is from 1 to 100% in units of 1%.
Defaults	none	
Command Modes	QOS-POLICY-OUT-ETS	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information

By default, equal bandwidth is assigned to each port queue and each dot1p priority in a priority group. To configure bandwidth amounts in associated dot1p queues, use the `bandwidth-percentage` command. When specified bandwidth is assigned to some port queues and not to others, the remaining bandwidth (100% minus assigned bandwidth amount) is equally distributed to unassigned nonstrict priority queues in the priority group. The sum of the allocated bandwidth to all queues in a priority group must be 100% of the bandwidth on the link.

ETS-assigned bandwidth allocation applies only to data queues, not to control queues.

The configuration of bandwidth allocation and strict-queue scheduling is not supported at the same time for a priority group. If you configure both, the configured bandwidth allocation is ignored for priority-group traffic when you apply the output policy on an interface.

By default, equal bandwidth is assigned to each priority group in the ETS output policy applied to an egress port if you did not configure bandwidth allocation. The sum of configured bandwidth allocation to dot1p priority traffic in all ETS priority groups must be 100%. Allocate at least 1% of the total bandwidth to each priority group and queue. If bandwidth is assigned to some priority groups but not to others, the remaining bandwidth (100% minus assigned bandwidth amount) is equally distributed to nonstrict-priority groups which have no configured scheduler.

Related Commands

- qos-policy-output ets — creates a QoS output policy.
- scheduler — schedules priority traffic in port queues.

dcb-enable

Enable data center bridging.

Syntax

```
dcb enable
```

To disable DCB, use the `no dcb enable` command.

Defaults	none	
Command Modes	CONFIGURATION	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.
Usage Information	DCB is not supported if you enable `link-level flow control` on one or more interfaces.	

dcb-map

Create a DCB map to configure priority flow control (PFC) and enhanced transmission selection (ETS) on Ethernet ports that support converged Ethernet traffic. Apply the DCB map to an Ethernet interface.

M I/O Aggregator and MXL 10/40GbE Switch with the FC Flex IO module

Syntax	`dcb-map` *`map-name`*	
Parameters	***map-name***	Enter a DCB map name. The maximum number of alphanumeric characters is 32.
Defaults	None. There are no pre-configured PFC and ETS settings on M I/O Aggregator and MXL 10/40GbE Switch with the FC Flex IO module Ethernet interfaces. With auto-detection of DCB enabled, a DCB map named 'dcb-map' is applied on all the Ethernet interfaces on which the DCBx frames are observed.	
Command Modes	CONFIGURATION INTERFACE	
Command History	**Version 9.3(0.0)**	Introduced on the M I/O Aggregator and MXL 10/40GbE Switch with the FC Flex IO module.

Usage Information

A DCB map is a template used to configure DCB parameters and apply them on converged Ethernet interfaces. DCB parameters include priority-based flow control (PFC) and enhanced traffic selection (ETS).

To display the PFC and ETS settings in DCB maps, enter the `show qos dcb-map` command.

Use the `dcb-map` command to create a DCB map to specify PFC and ETS settings and apply it on Ethernet ports. After you apply a DCB map to an interface, the PFC and ETS settings in the map are applied when the Ethernet port is enabled. DCBx is enabled on Ethernet ports by default.

The `dcb-map` command is supported only on physical Ethernet interfaces.

To remove a DCB map from an interface, enter the `no dcb-map map-name` command in Interface configuration mode.

Related Commands show qos dcb-map– displays the dcb-map profiles configured on the system.

dcb-policy input stack-unit stack-ports all

Apply the specified DCB input policy on all ports of the switch stack or a single stacked switch.

Syntax

```
dcb-policy input stack-unit {all | stack-unit-id} stack-ports
all dcb-input-policy-name
```

To remove all DCB input policies applied to the stacked ports and rest the PFC to its default settings, use the `no dcb-policy input stack-unit all` command.

To remove only the DCB input policies applied to the specified switch, use the `no dcb-policy input stack-unit` command.

Parameters

stack-unit-id	Enter the stack unit identification.
dcb-input-policy-name	Enter the policy name for the DCB input policy.

Defaults none

Command Modes CONFIGURATION

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information The `dcb-policy input stack-unit all` command overwrites any previous `dcb-policy input stack-unit stack-unit-id` configurations. Similarly, a `dcb-policy input stack-unit stack-unit-id` command overwrites any previous `dcb-policy input stack-unit all` configuration.

dcb-policy output

Apply the output policy with the ETS configuration to an egress interface.

Syntax

```
dcb-policy output policy-name
```

To delete the output policy, use the `no dcb-policy output` command.

Parameters

policy-name	Enter the output policy name.

Defaults none

Command Modes	INTERFACE	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.
Usage Information	When you apply an ETS output policy to on interface, ETS-configured scheduling and bandwidth allocation take precedence over any configured settings in QoS output policies. To remove an ETS output policy from an interface, use the `no dcb-policy output policy-name` command. ETS is enabled by default with the default ETS configuration applied (all dot1p priorities in the same group with equal bandwidth allocation).	

dcb-map stack-unit all stack-ports all

Apply the specified DCB map on all ports of the switch stack.

FC Flex IO Modules with I/O Aggregator

Syntax	`dcb-map stack-unit all stack-ports all` *`dcb-map-name`* To remove the PFC and ETS settings in a DCB map from all stack units, use the `no dcb-map stack-unit all stack-ports all` command.	
Parameters	***dcb-map-name***	Enter the name of the DCB map.
Defaults	None	
Command Modes	CONFIGURATION	
Command History	**Version 9.3(0.0)**	Introduced on the FC Flex IO module installed in the M I/O Aggregator.
Usage Information	The `dcb-map stack-unit all stack-ports all` command overwrites any previous DCB maps applied to stack ports.	
Related Commands	dcb-map – creates a DCB map to configure PFC and ETS parameters and applies the PFC and ETS settings on Ethernet ports.	

dcb-policy input stack-unit stack-ports all

Apply the specified DCB input policy on all ports of the switch stack or a single stacked switch.

Syntax	`dcb-policy input stack-unit {all |` *`stack-unit-id`*`} stack-ports all` *`dcb-input-policy-name`*

To remove all DCB input policies applied to the stacked ports and rest the PFC to its default settings, use the `no dcb-policy input stack-unit all` command.

To remove only the DCB input policies applied to the specified switch, use the `no dcb-policy input stack-unit` command.

Parameters

stack-unit-id	Enter the stack unit identification.
dcb-input-policy-name	Enter the policy name for the DCB input policy.

Defaults none

Command Modes CONFIGURATION

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information The `dcb-policy input stack-unit all` command overwrites any previous `dcb-policy input stack-unit stack-unit-id` configurations. Similarly, a `dcb-policy input stack-unit stack-unit-id` command overwrites any previous `dcb-policy input stack-unit all` configuration.

dcb-policy output

Apply the output policy with the ETS configuration to an egress interface.

Syntax `dcb-policy output policy-name`

To delete the output policy, use the `no dcb-policy output` command.

Parameters

policy-name	Enter the output policy name.

Defaults none

Command Modes INTERFACE

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information When you apply an ETS output policy to on interface, ETS-configured scheduling and bandwidth allocation take precedence over any configured settings in QoS output policies.

To remove an ETS output policy from an interface, use the `no dcb-policy output policy-name` command. ETS is enabled by default with the default ETS

configuration applied (all dot1p priorities in the same group with equal bandwidth allocation).

dcb stack-unit all pfc-buffering pfc-port-count pfc-queues

Configure the PFC buffer for all switches in the stack.

Syntax

```
dcb stack-unit all pfc-buffering pfc-port-count {1-56} pfc-queues {1-2}
```

To remove the configuration for the PFC buffer on all switches in the stack, use the `no dcb stack-unit all pfc-buffering pfc-port-count pfc-queues` command.

Parameters

pfc-port-count {1-56}	Enter the pfc-port count. The range is 1 to 56.
pfc-queues {1-2}	Enter the pfc-queue number. The range is 1 to 2.

Defaults

The PFC buffer is enabled on all ports on the stack unit.

Command Modes

CONFIGURATION

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information

If you configure PFC on a 40GbE port, count the 40GbE port as four PFC-enabled ports in the pfc-port number you enter in the command syntax.

To achieve lossless PFC operation, the PFC port count and queue number used for the reserved buffer size that is created must be greater than or equal to the buffer size required for PFC-enabled ports and lossless queues on the switch.

You must reload the stack or a specified stack unit (use the reload command in EXEC Privilege mode) for the PFC buffer configuration to take effect.

Related Commands

dcb stack-unit pfc-buffering pfc-port pfc-queues – configures the PFC buffer for all port pipes in a specified stack unit.

dcb stack-unit pfc-buffering pfc-port-count pfc-queues

Configure the PFC buffer for all port pipes in a specified stack unit by specifying the port-pipe number, number of PFC-enabled ports, and number of configured lossless queues.

Syntax

```
dcb stack-unit stack-unit-id [port-set port-set-id] pfc-buffering pfc-ports {1-56} pfc-queues {1-2}
```

To remove the configuration for the PFC buffer on all port pipes in a specified stack unit, use the `no dcb stack-unit stack-unit-id [port-set port-set-id] pfc-buffering pfc-ports pfc-queues` command.

Parameters

stack-unit-id	Enter the stack unit identification. The range is from 0 to 5.
port-set	Enter the port-set identification. The only valid port-set ID (port-pipe number) on an MXL Switch is 0.
pfc-ports ***{1-56}***	Enter the pfc-ports. The range is from 1 to 56.
pfc-queues ***{1-2}***	Enter the pfc-queue number. The range is from 1 to 2.

Command Modes CONFIGURATION

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information

If you configure PFC on a 40GbE port, count the 40GbE port as four PFC-enabled ports in the pfc-port number you enter in the command syntax.

To achieve lossless PFC operation, the PFC port count and queue number used for the reserved buffer size that is created must be greater than or equal to the buffer size required for PFC-enabled ports and lossless queues on the switch.

You must reload the stack or a specified stack unit (use the `reload` command in EXEC Privilege mode) for the PFC buffer configuration to take effect.

Related Commands dcb stack-unit all pfc-buffering pfc-port pfc-queues — configures the PFC buffer for all switches in the stack.

dcbx port-role

Configure the DCBX port role the interface uses to exchange DCB information.

Syntax

```
dcbx port-role {config-source | auto-downstream | auto-upstream | manual}
```

To remove DCBX port role, use the `no dcbx port-role {config-source | auto-downstream | auto-upstream | manual}` command.

Parameters	**config-source | auto-downstream | auto-upstream | manual**	Enter the DCBX port role, where: • `config-source`: configures the port to serve as the configuration source on the switch. • `auto-upstream`: configures the port to receive a peer configuration. The configuration source is elected from auto-upstream ports. • `auto-downstream`: configures the port to accept the internally propagated DCB configuration from a configuration source. • `manual`: configures the port to operate only on administer-configured DCB parameters. The port does not accept a DCB configuration received form a peer or a local configuration source.
Defaults	**Manual**	
Command Modes	INTERFACE PROTOCOL LLDP	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.
Usage Information	DCBX requires that you enable LLDP to advertise DCBX TLVs to peers. Configure DCBX operation at the INTERFACE level on a switch or globally on the switch. To verify the DCBX configuration on a port, use the `show interface dcbx detail` command.	

dcbx version

Configure the DCBX version used on the interface.

Syntax	`dcbx version {auto | cee | cin | ieee-v2.5}` To remove the DCBX version, use the `dcbx version {auto | cee | cin | ieee-v2.5}` command.	
Parameters	**auto | cee | cin | ieee-v2.5**	Enter the DCBX version type used on the interface, where: • `auto`: configures the port to operate using the DCBX version received from a peer. • `cee`: configures the port to use CDD (Intel 1.01). • `cin`: configures the port to use Cisco-Intel-Nuova (DCBX 1.0). • `ieee-v2`: configures the port to use IEEE 802.1az (Draft 2.5).

Defaults	**Auto**
Command Modes	INTERFACE PROTOCOL LLDP
Command History	**Version 9.2(0.0)** Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1 Introduced on the MXL 10/40GbE Switch IO Module.
Usage Information	DCBX requires that you enable LLDP to advertise DCBX TLVs to peers. Configure DCBX operation at the INTERFACE level on a switch or globally on the switch. To verify the DCBX configuration on a port, use the `show interface dcbx detail` command.

debug dcbx

Enable DCBX debugging.

Syntax	`debug dcbx {all | auto-detect-timer | config-exchng | fail | mgmt | resource | sem | tlv}` To disable DCBX debugging, use the `no debug dcbx` command.
Parameters	**{all | auto-detect-timer | config-exchng | fail | mgmt | resource | sem | tlv}** Enter the type of debugging, where: • `all`: enables all DCBX debugging operations. • `auto-detect-timer`: enables traces for DCBX auto-detect timers. • `config-exchng`: enables traces for DCBX configuration exchanges. • `fail`: enables traces for DCBX failures. • `mgmt`: enables traces for DCBX management frames. • `resource`: enables traces for DCBX system resource frames. • `sem`: enables traces for the DCBX state machine. • `tlv`: enables traces for DCBX TLVs.
Defaults	none
Command Modes	EXEC Privilege
Command History	**Version 9.2(0.0)** Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1 Introduced on the MXL 10/40GbE Switch IO Module.

fc-map

In an FCoE map, configure the FCoE mapped address prefix (FC-MAP) value which is used to identify FCoE traffic transmitted on the FCoE VLAN for the specified fabric.

M I/O Aggregator with the PMUX module

Syntax	`fc—map` *`fc-map-value`*	
Parameters	***fc-map-value***	Enter the unique MAC address prefix used by a SAN fabric. The range of FC-MAP values is from 0EFC00 to 0EFCFF.
Defaults	None	
Command Modes	FCOE MAP	
Command History	**Version 9.3(0.0)**	Introduced on the M I/O Aggregator with the PMUX module.
Usage Information	The FC-MAP value you enter must match the FC-MAP value used by an FC switch or FCoE forwarder (FCF) in the fabric. An FCF switch accepts only FCoE traffic that uses the correct FC-MAP value. The FC-MAP value is used to generate the fabric-provided MAC address (FP-MAC). The FPMA is used by servers to transmit FCoE traffic to the fabric. An FC-MAP can be associated with only one FCoE VLAN and vice versa. In an FCoE map, the FC-MAP value, fabric ID, and FCoE VLAN parameters must be unique. To remove a configured FC-MAP value from an FCoE map, enter the `no fc-map` command.	
Related Commands	fcoe-map — creates an FCoE map which contains the parameters used in the communication between servers and a SAN fabric.	

fcoe priority-bits

Configure the FCoE priority advertised for the FCoE protocol in application priority TLVs.

Syntax	`fcoe priority-bits` *`priority-bitmap`* To remove the configured FCoE priority, use the `no fcoe priority-bits` command.	
Parameters	***priority-bitmap***	Enter the priority-bitmap range. The range is from 1 to FF.

Defaults	0x8	
Command Modes	PROTOCOL LLDP	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.
Usage Information	This command is available at the global level only.	

fcoe-map

Create an FCoE map which contains the parameters used to configure the links between server CNAs and a SAN fabric. Apply the FCoE map on a server-facing Ethernet port.

M I/O Aggregator with the PMUX module

Syntax `fcoe-map map-name`

Parameters

map-name	Maximum: 32 alphanumeric characters.

Defaults On the I/O Aggregator with PMUX modules, the following parameters are applied on all the PMUX module interfaces:

- Description: SAN_FABRIC
- Fabric-id: 1002
- Fcoe-vlan: 1002
- Fc-map: 0x0efc00
- Fcf-priority: 128
- Fka-adv-period: 8000mSec
- Keepalive: enable
- Vlan priority: 3

Command Modes CONFIGURATION
INTERFACE

Command History	**Version 9.3(0.0)**	Introduced on the M I/O Aggregator with the PMUX module.

Usage Information An FCoE map is a template used to map FCoE and FC parameters in a converged fabric. An FCoE map is used to virtualize upstream FC ports on an M I/O Aggregator and MXL 10/40GbE Switch with the PMUX module NPIV proxy gateway so that they appear to downstream server CNA ports as FCoE forwarder (FCF) ports on an FCoE network. When applied to FC and Ethernet ports on an NPIV proxy gateway, an FCoE map allows the switch to operate as an FCoE-FC bridge

between an FC SAN and an FCoE network by providing FCoE-enabled servers and switches with the necessary parameters to log in to a SAN fabric.

On an M I/O Aggregator and MXL 10/40GbE Switch with the PMUX module NPIV proxy gateway, you cannot apply an FCoE map is applied on fabric-facing FC ports and server-facing 10–Gigabit Ethernet ports.

An FCoE map consists of the following parameters: the dedicated FCoE VLAN used for storage traffic, the destination SAN fabric (FC-MAP value), FCF priority used by a server, and the FIP keepalive (FKA) advertisement timeout.

In each FCoE map, the fabric ID, FC-MAP value, and FCoE VLAN parameters must be unique. Use one FCoE map to access one SAN fabric. You cannot use the same FCoE map to access different fabrics.

To remove an FCoE map from an Ethernet interface, enter the `no fcoe-map` *`map-name`* command in Interface configuration mode.

Related Commands show fcoe-map— displays the Fibre Channel and FCoE configuration parameters in FCoE maps.

fka-adv-period

In an FCoE map, configure the time interval used to transmit FIP keepalive (FKA) advertisements.

M I/O Aggregator with the PMUX module

Syntax `fka-adv-period` *`seconds`*

Parameters

seconds	Enter the time period (in seconds) used to send FIP keepalive messages to peer devices. The range is from 8 to 90 seconds.

Defaults 8 seconds

Command Modes FCOE MAP

Command History

Version 9.3(0.0)	Introduced on the M I/O Aggregator with the PMUX module.

Usage Information To delete the FIP keepalive time period from an FCoE map, enter the `no fka-adv-erpiod` command.

Related Commands fcoe-map — creates an FCoE map which contains the parameters used in the communication between servers and a SAN fabric.

iscsi priority-bits

Configure the iSCSI priority advertised for the iSCSI protocol in application priority TLVs.

Syntax	`iscsi priority-bits` *`priority-bitmap`* To remove the configured iSCSI priority, use the `no iscsi priority-bits` command.	
Parameters	***priority-bitmap***	Enter the priority-bitmap range. The range is from 1 to FF.
Defaults	0x10	
Command Modes	PROTOCOL LLDP	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.
Usage Information	This command is available at the global level only.	

keepalive

In an FCoE map, enable the monitoring of FIP keepalive messages (if it is disabled).

M I/O Aggregator with the PMUX module

Syntax	`keepalive`	
Parameters	None	
Defaults	FIP keepalive monitoring is enabled on Ethernet and Fibre Channel interfaces.	
Command Modes	FCOE MAP	
Command History	**Version 9.3(0.0)**	Introduced on the M I/O Aggregator with the PMUX module.
Usage Information	FIP keepalive (FKA) messaging is used to detect if other FCoE devices are reachable. To remove FIP keepalive monitoring from an FCoE map, enter the `no keepalive` command.	
Related Commands	fcoe-map — creates an FCoE map which contains the parameters used in the communication between servers and a SAN fabric.	

interface vlan (NPIV proxy gateway)

Create a dedicated VLAN to be used to send and receive Fibre Channel traffic over FCoE links between servers and a fabric over an M I/O Aggregator and MXL 10/40GbE Switch with the PMUX module NPIV proxy gateway.

M I/O Aggregator with the PMUX module

Syntax

```
interface vlan vlan-id
```

Parameters

vlan-id	Enter a number as the VLAN Identifier. The range is 1 to 4094.

Defaults

Not configured.

Command Modes

CONFIGURATION

Command History

Version 9.3.0.0	Introduced on the M I/O Aggregator and MXL 10/40GbE Switch with the PMUX module configured as an NPIV proxy gateway.

Usage Information

FCoE storage traffic received from servers on an M I/O Aggregator and MXL 10/40GbE Switch with the PMUX module NPIV proxy gateway is de-capsulated into Fibre Channel packets and forwarded over FC links to SAN switches in a specified fabric. You must configure a separate FCoE VLAN for each fabric to which FCoE traffic is forwarded. Any non-FCoE traffic sent on a dedicated FCoE VLAN will be dropped.

You configure the association between a dedicated VLAN, which carries FCoE traffic from server CNAs over the NPIV proxy gateway to a SAN fabric in which destination storage arrays are installed, in an FCoE map by using the `fabric id vlan` command.

When you apply an FCoE map to a server-facing Ethernet port, the port is automatically configured as a tagged member of the FCoE VLAN.

For more information about VLANs and the commands to configure them, refer to the Virtual LAN (VLAN) Commandssection of theLayer 2 chapter.

Example (Single Range)

```
Dell(conf)#interface vlan 10
Dell(conf-if-vl-3)#
```

Related Commands

fcoe-map — creates an FCoE map which contains the parameters used in the communication between servers and a SAN fabric.

pfc link-delay

Configure the link delay used to pause specified priority traffic.

Syntax

`pfc link-delay value`

To remove the link delay, use the `no pfc link-delay` command.

Parameters

value	The range is (in quanta) from 712 to 65535. One quantum is equal to a 512-bit transmission.

Defaults

45556 quantum

Command Modes

DCB INPUT POLICY

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information

The minimum link delay must be greater than the round-trip transmission time a peer must honor a PFC pause frame multiplied by the number of PFC-enabled ingress ports.

pfc mode on

Enable the PFC configuration on the port so that the priorities are included in DCBX negotiation with peer PFC devices.

Syntax

`pfc mode on`

To disable the PFC configuration, use the `no pfc mode on` command.

Defaults

PFC mode is on.

Command Modes

DCB MAP

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information

By applying a DCB input policy with PFC enabled, you enable PFC operation on ingress port traffic. To achieve complete lossless handling of traffic, also enable PFC on all DCB egress ports or configure the dot1p priority-queue assignment of PFC priorities to lossless queues (refer to `pfc no-drop queues`).

To disable PFC operation on an interface, enter the `no pfc mode on` command in DCB Input Policy Configuration mode. PFC is enabled and disabled as global DCB operation is enabled (`dcb-enable`) or disabled (`no dcb-enable`).

You cannot enable PFC and link-level flow control at the same time on an interface.

pfc no-drop queues

Configure the port queues that still function as no-drop queues for lossless traffic.

Syntax

`pfc no-drop queues` *`queue-range`*

To remove the no-drop port queues, use the `no pfc no-drop queues` command.

Parameters

queue-range	Enter the queue range. Separate the queue values with a comma; specify a priority range with a dash; for example, `pfc no-drop queues 1,3` or `pfc no-drop queues 2-3`. The range is from 0 to 3.

Defaults

No lossless queues are configured.

Command Modes

INTERFACE

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information

The maximum number of lossless queues globally supported on the switch is two.

- The following lists the dot1p priority-queue assignments.

dot1p Value in the Incoming Frame	Description heading
0	0
1	0
2	0
3	1
4	2
5	3
6	3
7	3

pfc priority

Configure the CoS traffic to be stopped for the specified delay.

Syntax

`pfc priority` *priority-range*

To delete the pfc priority configuration, use the `no pfc priority` command.

Parameters

priority-range	Enter the 802.1p values of the frames to be paused. Separate the priority values with a comma; specify a priority range with a dash; for example, pfc priority 1,3,5-7. The range is from 0 to 7.

Defaults

none

Command Modes

Interface

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information

You can enable any number of 802.1p priorities for PFC. Queues to which PFC priority traffic is mapped are lossless by default. Traffic may be interrupted due to an interface flap (going down and coming up) when you reconfigure the lossless queues for no-drop priorities in a PFC input policy and reapply the policy to an interface.

The maximum number of lossless queues supported on the I/O Aggregator switch is four.

A PFC peer must support the configured priority traffic (as DCBX detects) to apply PFC.

priority-pgid

Assign 802.1p priority traffic to a priority group in a DCB map.

FC Flex IO Modules I/O Aggregator

Syntax

`priority-pgid` *dot1p0_group-num dot1p1_group-num dot1p2_group-num dot1p3_group-num dot1p4_group-num dot1p5_group-num dot1p6_group-num dot1p7_group-num*

Parameters

dot1p0_group-num	Enter the priority group number for each 802.1p class of traffic in a DCB map.

dot1p1_group-num

dot1p2_group-num

dot1p3_group-num

dot1p4_group-num

dot1p5_group-num

dot1p6_group-num

dot1p7_group-num

Defaults None

Command Modes DCB MAP

Command History

Version 9.3(0.0)	Introduced on the FC Flex IO module installed in the M I/O Aggregator.

Usage Information

PFC and ETS settings are not pre-configured on Ethernet ports. You must use the `dcb-map` command to configure different groups of 802.1p priorities with PFC and ETS settings.

Using the `priority-pgid` command, you assign each 802.1p priority to one priority group. A priority group consists of 802.1p priority values that are grouped together for similar bandwidth allocation and scheduling, and that share latency and loss requirements. All 802.1p priorities mapped to the same queue must be in the same priority group. For example, the `priority-pgid 0 0 0 1 2 4 4 4` command creates the following groups of 802.1p priority traffic:

- Priority group 0 contains traffic with dot1p priorities 0, 1, and 2.
- Priority group 1 contains traffic with dot1p priority 3.
- Priority group 2 contains traffic with dot1p priority 4.
- Priority group 4 contains traffic with dot1p priority 5, 6, and 7.

To remove a priority-pgid configuration from a DCB map, enter the `no priority-pgid` command.

Related Commands

dcb-map —Creates a DCB map to configure PFC and ETS parameters and applies the PFC and ETS settings on Ethernet ports.

priority-group bandwidth pfc— Configures the ETS bandwidth allocation and the PFC setting used to manage the port traffic in an 802.1p priority group.

pfc mode on

Enable the PFC configuration on the port so that the priorities are included in DCBX negotiation with peer PFC devices.

Syntax

```
pfc mode on
```

To disable the PFC configuration, use the `no pfc mode on` command.

Defaults

PFC mode is on.

Command Modes

DCB INPUT POLICY

Command History

Version 9.3(0.0)	Introduced on the M I/O Aggregator.

Usage Information

By applying a DCB input policy with PFC enabled, you enable PFC operation on ingress port traffic. To achieve complete lossless handling of traffic, also enable PFC on all DCB egress ports or configure the dot1p priority-queue assignment of PFC priorities to lossless queues (refer to `pfc no-drop queues`).

To disable PFC operation on an interface, enter the `no pfc mode on` command in DCB Input Policy Configuration mode. PFC is enabled and disabled as global DCB operation is enabled (`dcb-enable`) or disabled (`no dcb-enable`).

You cannot enable PFC and link-level flow control at the same time on an interface.

Related Commands

dcb-input — creates a DCB input policy.

priority-group bandwidth pfc

Configure the ETS bandwidth allocation and PFC mode used to manage port traffic in an 802.1p priority group.

I/O Aggregator

Syntax

```
priority-group group-num {bandwidth percentage| strict-priority} pfc {on | off}
```

Parameters

priority-group *group-num*	Enter the keyword `priority-group` followed by the number of an 802.1p priority group. Use the `priority-pgid` command to create the priority groups in a DCB map.
bandwidth *percentage*	Enter the keyword `bandwidth` followed by a bandwidth percentage allocated to the priority group. The range of valid

	values is 1 to 100. The sum of all allocated bandwidth percentages in priority groups in a DCB map must be 100%.
strict-priority	Configure the priority-group traffic to be handled with strict priority scheduling. Strict-priority traffic is serviced first, before bandwidth allocated to other priority groups is made available.
pfc {on | off}	Configure whether priority-based flow control is enabled (on) or disabled (off) for port traffic in the priority group.

Defaults

None

Command Modes

DCB MAP

Command History

Version 9.3(0.0)	Introduced on the FC Flex IO module installed in the M I/O Aggregator.

Usage Information

Use the `dcb-map` command to configure priority groups with PFC and/or ETS settings and apply them to Ethernet interfaces.

Use the `priority-pgid` command to map 802.1p priorities to a priority group. You can assign each 802.1p priority to only one priority group. A priority group consists of 802.1p priority values that are grouped together for similar bandwidth allocation and scheduling, and that share latency and loss requirements. All 802.1p priorities mapped to the same queue must be in the same priority group.

Repeat the `priority-group bandwidth pfc` command to configure PFC and ETS traffic handling for each priority group in a DCB map.

You can enable PFC on a maximum of two priority queues.

If you configure more than one priority group as strict priority, the higher numbered priority queue is given preference when scheduling data traffic.

If a priority group does not use its allocated bandwidth, the unused bandwidth is made available to other priority groups.

To remove a priority-group configuration in a DCB map, enter the `no priority-group bandwidth pfc` command.

By default, equal bandwidth is assigned to each dot1p priority in a priority group. Use the `bandwidth` parameter to configure the bandwidth percentage assigned to a priority group. The sum of the bandwidth allocated to all priority groups in a DCB map must be 100% of the bandwidth on the link. You must allocate at least 1% of the total port bandwidth to each priority group.

Related Commands

dcb-map – Creates a DCB map to configure PFC and ETS parameters and applies the PFC and ETS settings on Ethernet ports.

priority-pgid – Configures the 802.1p priority traffic in a priority group for a DCB map.

qos-policy-output ets

To configure the ETS bandwidth allocation and scheduling for priority traffic, create a QoS output policy.

Syntax

`qos-policy-output` *`policy-name`* `ets`

To remove the QoS output policy, use the `no qos-policy-output ets` command.

Parameters

policy-name	Enter the policy name. The maximum is 32 characters.

Command Modes

CONFIGURATION

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information

If an error occurs in an ETS output-policy configuration, the configuration is ignored and the scheduler and bandwidth allocation settings are reset to the ETS default values (all priorities are in the same ETS priority group and bandwidth is allocated equally to each priority).

If an error occurs when a port receives a peer's ETS configuration, the port's configuration is reset to the previously configured ETS output policy. If no ETS output policy was previously applied, the port is reset to the default ETS parameters.

Related Commands

- scheduler — schedules the priority traffic in port queues.
- bandwidth-percentage — bandwidth percentage allocated to the priority traffic in port queues.

scheduler

Configure the method used to schedule priority traffic in port queues.

Syntax

`scheduler` *`value`*

To remove the configured priority schedule, use the `no scheduler` command.

Parameters

value	Enter schedule priority value. The valid values are: • `strict`: strict-priority traffic is serviced before any other queued traffic.

- `werr`: weighted elastic round robin (werr) provides low-latency scheduling for priority traffic on port queues.

Defaults	Weighted elastic round robin (WERR) scheduling is used to queue priority traffic.
Command Modes	POLICY-MAP-OUT-ETS
Command History	**Version 9.2(0.0)** Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only. **Version 8.3.16.1** Introduced on the MXL 10/40GbE Switch IO Module.
Usage Information	dot1p priority traffic on the switch is scheduled to the current queue mapping. dot1p priorities within the same queue must have the same traffic properties and scheduling method. ETS-assigned scheduling applies only to data queues, not to control queues. The configuration of bandwidth allocation and strict-queue scheduling is not supported at the same time for a priority group. If you configure both, the configured bandwidth allocation is ignored for priority-group traffic when you apply the output policy on an interface.
Related Commands	• bandwidth-percentage — bandwidth percentage allocated to priority traffic in port queues.

show dcb

Displays the data center bridging status, the number of PFC-enabled ports, and the number of PFC-enabled queues.

Syntax	`show dcb [stack-unit unit-number]`
Parameters	***unit number*** Enter the DCB unit number. The range is from 0 to 5.
Command Modes	EXEC Privilege
Command History	**Version 9.2(0.0)** Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only. **Version 8.3.16.1** Introduced on the MXL 10/40GbE Switch IO Module.
Usage Information	Specify a stack-unit number on the Master switch in a stack.

Example	`Dell# show dcb`
	`stack-unit 0 port-set 0`
	`DCB Status : Enabled`

```
    PFC Port Count : 56 (current), 56 (configured)
PFC Queue Count : 2 (current), 2 (configured)
```

show interface dcbx detail

Displays the DCBX configuration on an interface.

Syntax `show interface port-type slot/port dcbx detail`

Parameters

port-type	Enter the port type.
slot/port	Enter the slot/port number.

Command Modes CONFIGURATION

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information To clear DCBX frame counters, use the `clear dcbx counters interface stack-unit/port` command.

The following describes the `show interface dcbx detail` command shown in the following example.

Field	Description
Interface	Interface type with chassis slot and port number.
Port-Role	Configured the DCBX port role: auto-upstream, auto-downstream, config-source, or manual.
DCBX Operational Status	Operational status (enabled or disabled) used to elect a configuration source and internally propagate a DCB configuration. The DCBX operational status is the combination of PFC and ETS operational status.
Configuration Source	Specifies whether the port serves as the DCBX configuration source on the switch: true (yes) or false (no).
Local DCBX Compatibility mode	DCBX version accepted in a DCB configuration as compatible. In auto-upstream mode, a port can only receive a DCBX version supported on the remote peer.
Local DCBX Configured mode	DCBX version configured on the port: CEE, CIN, IEEE v2.5, or Auto (port auto-configures to use the DCBX version received from a peer).
Peer Operating version	DCBX version that the peer uses to exchange DCB parameters.

Field	Description
Local DCBX TLVs Transmitted	Transmission status (enabled or disabled) of advertised DCB TLVs (see TLV code at the top of the show command output).
Local DCBX Status: DCBX Operational Version	DCBX version advertised in Control TLVs.
Local DCBX Status: DCBX Max Version Supported	Highest DCBX version supported in Control TLVs.
Local DCBX Status: Sequence Number	Sequence number transmitted in Control TLVs.
Local DCBX Status: Acknowledgment Number	Acknowledgement number transmitted in Control TLVs.
Local DCBX Status: Protocol State	Current operational state of the DCBX protocol: ACK or IN-SYNC.
Peer DCBX Status: DCBX Operational Version	DCBX version advertised in Control TLVs received from the peer device.
Peer DCBX Status: DCBX Max Version Supported	Highest DCBX version supported in Control TLVs received from the peer device.
Peer DCBX Status: Sequence Number	Sequence number transmitted in Control TLVs received from the peer device.
Peer DCBX Status: Acknowledgment Number	Acknowledgement number transmitted in Control TLVs received from the peer device.
PFC TLV Statistics: Input PFC TLV pkts	Number of PFC TLVs received.
PFC TLV Statistics: Output PFC TLV pkts	Number of PFC TLVs transmitted.
PFC TLV Statistics: Error PFC pkts	Number of PFC error packets received.
PFC TLV Statistics: PFC Pause Tx pkts	Number of PFC pause frames transmitted.

Field	Description
PFC TLV Statistics: PFC Pause Rx pkts	Number of PFC pause frames received.
PFC TLV Statistics: Input PG TLV Pkts	Number of PG TLVs received.
PFC TLV Statistics: Output PG TLV Pkts	Number of PG TLVs transmitted.
PFC TLV Statistics: Error PG TLV Pkts	Number of PG error packets received.
Application Priority TLV Statistics: Input Appln Priority TLV pkts	Number of Application TLVs received.
Application Priority TLV Statistics: Output Appln Priority TLV pkts	Number of Application TLVs transmitted.
Application Priority TLV Statistics: Error Appln Priority TLV Pkts	Number of Application TLV error packets received
Total DCBX Frames transmitted	Number of DCBX frames sent from the local port.
Total DCBX Frames received	Number of DCBX frames received from the remote peer port.
Total DCBX Frame errors	Number of DCBX frames with errors received.
Total DCBX Frames unrecognized	Number of unrecognizable DCBX frames received.

Example

```
Dell(conf)# show interface tengigabitethernet 0/49 dcbx detail
Dell#show interface te 0/49 dcbx detail

E-ETS Configuration TLV enabled
  e-ETS Configuration TLV disabled
R-ETS Recommendation TLV enabled
  r-ETS Recommendation TLV disabled
P-PFC Configuration TLV enabled
  p-PFC Configuration TLV disabled
F-Application priority for FCOE enabled
  f-Application Priority for FCOE disabled
```

```
I-Application priority for iSCSI enabled
  i-Application Priority for iSCSI disabled
-------------------------------------------------------------

Interface TenGigabitEthernet 0/49
  Remote Mac Address 00:00:00:00:00:11
   Port Role is Auto-Upstream
  DCBX Operational Status is Enabled
  Is Configuration Source? TRUE

Local DCBX Compatibility mode is CEE
  Local DCBX Configured mode is CEE
  Peer Operating version is CEE
  Local DCBX TLVs Transmitted: ErPfi

Local DCBX Status
-----------------
  DCBX Operational Version is 0
  DCBX Max Version Supported is 0
  Sequence Number: 2
  Acknowledgment Number: 2
  Protocol State: In-Sync

Peer DCBX Status:
----------------
  DCBX Operational Version is 0
  DCBX Max Version Supported is 255
  Sequence Number: 2
  Acknowledgment Number: 2
2 Input PFC TLV pkts, 3 Output PFC TLV pkts, 0 Error PFC pkts,
0 PFC Pause Tx pkts,
0 Pause Rx pkts
2 Input PG TLV Pkts, 3 Output PG TLV Pkts, 0 Error PG TLV Pkts
2 Input Appln Priority TLV pkts, 0 Output Appln Priority TLV
pkts, 0 Error Appln Priority
TLV Pkts  Total DCBX Frames transmitted 27
  Total DCBX Frames received 6
  Total DCBX Frame errors 0
  Total DCBX Frames unrecognized 0
```

show interface ets

Displays the ETS configuration applied to egress traffic on an interface, including priority groups with priorities and bandwidth allocation.

Syntax	`show interface` *port-type slot/port* `ets {summary | detail}`	
Parameters	***port-type slot/ port* ets**	Enter the port-type slot and port ETS information.
	{summary | detail}	Enter the keyword `summary` for a summary list of results or enter the keyword `detail` for a full list of results.
Command Modes	CONFIGURATION	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.

Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information

To clear ETS TLV counters, use the `clear ets counters interface` *`port-type slot/port`* command.

The following describes the `show interface summary` command shown in the following example.

Field	Description
Interface	Interface type with stack-unit and port number.
Max Supported TC Group	Maximum number of priority groups supported.
Number of Traffic Classes	Number of 802.1p priorities currently configured.
Admin mode	ETS mode: on or off. When on, the scheduling and bandwidth allocation configured in an ETS output policy or received in a DCBX TLV from a peer can take effect on an interface.
Admin Parameters	ETS configuration on local port, including priority groups, assigned dot1p priorities, and bandwidth allocation.
Remote Parameters	ETS configuration on remote peer port, including admin mode (enabled if a valid TLV was received or disabled), priority groups, assigned dot1p priorities, and bandwidth allocation. If ETS admin mode is enabled on the remote port for DCBX exchange, the Willing bit received in ETS TLVs from the remote peer is included.
Local Parameters	ETS configuration on local port, including admin mode (enabled when a valid TLV is received from a peer), priority groups, assigned dot1p priorities, and bandwidth allocation.
Operational status (local port)	Port state for current operational ETS configuration: • `Init`: Local ETS configuration parameters were exchanged with the peer. • `Recommend`: Remote ETS configuration parameters were received from the peer. • `Internally propagated`: ETS configuration parameters were received from the configuration source.
ETS DCBX Oper status	Operational status of the ETS configuration on the local port: match or mismatch.
State Machine Type	Type of state machine used for DCBX exchanges of ETS parameters: Feature — for legacy DCBX versions; Asymmetric — for an IEEE version.

Field	Description
Conf TLV Tx Status	Status of ETS Configuration TLV advertisements: enabled or disabled.
ETS TLV Statistic: Input Conf TLV pkts	Number of ETS Configuration TLVs received.
ETS TLV Statistic: Output Conf TLV pkts	Number of ETS Configuration TLVs transmitted.
ETS TLV Statistic: Error Conf TLV pkts	Number of ETS Error Configuration TLVs received.
ETS TLV Statistic: Input Reco TLV pkts	Number of ETS Recommendation TLVs received.
ETS TLV Statistic: Output Reco TLV pkts	Number of ETS Recommendation TLVs transmitted.
ETS TLV Statistic: Error Reco TLV pkts	Number of ETS Error Recommendation TLVs received.

Example (Summary)

```
Dell(conf)# show interfaces te 0/0 ets summary
Interface TenGigabitEthernet 0/0
Max Supported TC Groups is 4
Number of Traffic Classes is 8
Admin mode is on
Admin Parameters:
------------------
Admin is enabled
TC-grp Priority#        Bandwidth TSA
0      0,1,2,3,4,5,6,7  100%      ETS
1                         0%      ETS
2                         0%      ETS
3                         0%      ETS
4                         0%      ETS
5                         0%      ETS
6                         0%      ETS
7                         0%      ETS
Priority#              Bandwidth  TSA
0                        13%      ETS
1                        13%      ETS
2                        13%      ETS
3                        13%      ETS
4                        12%      ETS
5                        12%      ETS
6                        12%      ETS
7                        12%      ETS
Remote Parameters:
-------------------
Remote is disabled
Local Parameters:
```

```
------------------
Local is enabled
TC-grp Priority#        Bandwidth TSA
0      0,1,2,3,4,5,6,7  100%      ETS
1                         0%      ETS
2                         0%      ETS
3                         0%      ETS
4                         0%      ETS
5                         0%      ETS
6                         0%      ETS
7                         0%      ETS
Priority#               Bandwidth TSA
0                        13%      ETS
1                        13%      ETS
2                        13%      ETS
3                        13%      ETS
4                        12%      ETS
5                        12%      ETS
6                        12%      ETS
7                        12%      ETS
Oper status is init
Conf TLV Tx Status is disabled
Traffic Class TLV Tx Status is disabled
```

Example (Detail)

```
Dell(conf)# show interfaces tengigabitethernet 0/0 ets detail
Interface TenGigabitEthernet 0/0
Max Supported TC Groups is 4
Number of Traffic Classes is 8
Admin mode is on
Admin Parameters :
------------------
Admin is enabled
TC-grp Priority#        Bandwidth TSA
0      0,1,2,3,4,5,6,7  100%      ETS
1                       0%        ETS
2                       0%        ETS
3                       0%        ETS
4                       0%        ETS
5                       0%        ETS
6                       0%        ETS
7                       0%        ETS

Priority#               Bandwidth TSA
0                       13%       ETS
1                       13%       ETS
2                       13%       ETS
3                       13%       ETS
4                       12%       ETS
5                       12%       ETS
6                       12%       ETS
7                       12%       ETS
Remote Parameters:
-------------------
Remote is disabled

Local Parameters :
------------------
Local is enabled
TC-grp Priority#        Bandwidth TSA
0      0,1,2,3,4,5,6,7  100%      ETS
1                       0%        ETS
2                       0%        ETS
3                       0%        ETS
```

```
4                       0%          ETS
5                       0%          ETS
6                       0%          ETS
7                       0%          ETS

Priority#               Bandwidth TSA
0                       13%         ETS
1                       13%         ETS
2                       13%         ETS
3                       13%         ETS
4                       12%         ETS
5                       12%         ETS
6                       12%         ETS
7                       12%         ETS
Oper status is init
Conf TLV Tx Status is disabled
Traffic Class TLV Tx Status is disabled
0 Input Conf TLV Pkts, 0 Output Conf TLV Pkts, 0 Error Conf
TLV Pkts
0 Input Traffic Class TLV Pkts, 0 Output Traffic Class TLV
Pkts, 0 Error Traffic Class
TLV
Pkts
```

show interface pfc

Displays the PFC configuration applied to ingress traffic on an interface, including priorities and link delay.

Syntax

```
show interface port-type slot/port pfc {summary | detail}
```

Parameters

port-type slot/ port pfc	Enter the port-type slot and port PFC information.
{summary | detail}	Enter the keyword `summary` for a summary list of results or enter the keyword `detail` for a full list of results.

Command Modes

INTERFACE

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information

To clear the PFC TLV counters, use the `clear pfc counters interface` *`port-type slot/port`* command.

The following describes the `show interface pfc summary` command shown in the following example.

Field	Description
Interface	Interface type with stack-unit and port number.

Field	Description
Admin mode is on Admin is enabled	PFC admin mode is on or off with a list of the configured PFC priorities. When the PFC admin mode is on, PFC advertisements are enabled to be sent and received from peers; received PFC configuration take effect. The admin operational status for a DCBX exchange of PFC configuration is enabled or disabled.
Remote is enabled, Priority list Remote Willing Status is enabled	Operational status (enabled or disabled) of peer device for DCBX exchange of PFC configuration with a list of the configured PFC priorities. Willing status of peer device for DCBX exchange (Willing bit received in PFC TLV): enabled or disable.
Local is enabled	DCBX operational status (enabled or disabled) with a list of the configured PFC priorities.
Operational status (local port)	Port state for current operational PFC configuration: • `Init`: Local PFC configuration parameters were exchanged with the peer. • `Recommend`: Remote PFC configuration parameters were received from the peer. • `Internally propagated`: PFC configuration parameters were received from the configuration source.
PFC DCBX Oper status	Operational status for the exchange of the PFC configuration on the local port: match (up) or mismatch (down).
State Machine Type	Type of state machine used for DCBX exchanges of the PFC parameters: Feature — for legacy DCBX versions; Symmetric — for an IEEE version.
TLV Tx Status	Status of the PFC TLV advertisements: enabled or disabled.
PFC Link Delay	Link delay (in quanta) used to pause specified priority traffic.
Application Priority TLV: FCOE TLV Tx Status	Status of FCoE advertisements in application priority TLVs from the local DCBX port: enabled or disabled.
Application Priority TLV: SCSI TLV Tx Status	Status of ISCSI advertisements in application priority TLVs from the local DCBX port: enabled or disabled.
Application Priority TLV: Local FCOE Priority Map	Priority bitmap the local DCBX port uses in FCoE advertisements in application priority TLVs.
Application Priority TLV: Local ISCSI Priority Map	Priority bitmap the local DCBX port uses in ISCSI advertisements in application priority TLVs.

Field	Description
Application Priority TLV: Remote FCOE Priority Map	Status of FCoE advertisements in application priority TLVs from the remote peer port: enabled or disabled.
Application Priority TLV: Remote ISCSI Priority Map	Status of iSCSI advertisements in application priority TLVs from the remote peer port: enabled or disabled.
PFC TLV Statistics: Input TLV pkts	Number of PFC TLVs received.
PFC TLV Statistics: Output TLV pkts	Number of PFC TLVs transmitted.
PFC TLV Statistics: Error pkts	Number of PFC error packets received.
PFC TLV Statistics: Pause Tx pkts	Number of PFC pause frames transmitted.
PFC TLV Statistics: Pause Rx pkts	Number of PFC pause frames received.
PFC TLV Statistics: Input Appln Priority TLV pkts	Number of Application Priority TLVs received.
Output Appln Priority TLV pkts	Number of Application Priority TLVs transmitted.
Error Appln Priority TLV pkts	Number of Application Priority error packets received.

Example (Summary)

```
Dell# show interfaces tengigabitethernet 0/49 pfc summary
Interface TenGigabitEthernet 0/49
  Admin mode is on
  Admin is enabled
  Remote is enabled, Priority list is 4
  Remote Willing Status is enabled
  Local is enabled
  Oper status is Recommended
  PFC DCBX Oper status is Up
  State Machine Type is Feature
  TLV Tx Status is enabled
  PFC Link Delay 45556 pause quantams
  Application Priority TLV Parameters :
  ------------------------------------
  FCOE TLV Tx Status is disabled
  ISCSI TLV Tx Status is disabled
  Local FCOE PriorityMap is 0x8
  Local ISCSI PriorityMap is 0x10
  Remote FCOE PriorityMap is 0x8
  Remote ISCSI PriorityMap is 0x8

Dell# show interfaces tengigabitethernet 0/49 pfc detail
```

```
  Interface TenGigabitEthernet 0/49
  Admin mode is on
  Admin is enabled
  Remote is enabled
  Remote Willing Status is enabled
  Local is enabled
  Oper status is recommended
  PFC DCBX Oper status is Up
  State Machine Type is Feature
  TLV Tx Status is enabled
  PFC Link Delay 45556 pause quanta
  Application Priority TLV Parameters :
  -------------------------------------
  FCOE TLV Tx Status is disabled
  ISCSI TLV Tx Status is disabled
  Local FCOE PriorityMap is 0x8
  Local ISCSI PriorityMap is 0x10
  Remote FCOE PriorityMap is 0x8
  Remote ISCSI PriorityMap is 0x8
  0 Input TLV pkts, 1 Output TLV pkts, 0 Error pkts,
  0 Pause Tx pkts, 0 Pause Rx pkts
2 Input Appln Priority TLV pkts, 0 Output Appln Priority TLV
pkts, 0 Error Appln Priority TLV Pkts
```

show interface pfc statistics

Displays counters for the PFC frames received and transmitted (by dot1p priority class) on an interface.

Syntax

```
show interface port-type slot/port pfc statistics
```

Parameters

port-type	Enter the port type.
slot/port	Enter the slot/port number.

Command Modes

INTERFACE

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Example (Summary)

```
Dell#show interfaces te 0/3 pfc statistics
Interface TenGigabitEthernet 0/3

Priority Rx XOFF Frames Rx Total Frames Tx Total Frames
-----------------------------------------------------
0        0              0               0
1        0              0               0
2        0              0               0
3        0              0               0
4        0              0               0
5        0              0               0
6        0              0               0
7        0              0               0
```

show stack-unit stack-ports ets details

Displays the ETS configuration applied to egress traffic on stacked ports, including ETS Operational mode on each unit and the configurated priority groups with dot1p priorities, bandwidth allocation, and scheduler type.

Syntax

```
show stack-unit {all | stack-unit} stack-ports {all | port-number} ets details
```

Parameters

stack-unit	Enter the stack unit identification.
port-number	Enter the port number.

Command Modes

CONFIGURATION

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Example

```
Dell(conf)# show stack-unit all stack-ports all ets details

Stack unit 0 stack port all
Max Supported TC Groups is 4
Number of Traffic Classes is 1
Admin mode is on

Admin Parameters:
--------------------
Admin is enabled
TC-grp Priority#        Bandwidth TSA
-----------------------------------------------
0      0,1,2,3,4,5,6,7  100%      ETS
1                       - -
2                       - -
3                       - -
4                       - -
5                       - -
6                       - -
7                       - -
8                       - -

Stack unit 1 stack port all
Max Supported TC Groups is 4
Number of Traffic Classes is 1
Admin mode is on
Admin Parameters:
--------------------
Admin is enabled
TC-grp Priority#        Bandwidth TSA
-----------------------------------------------
0      0,1,2,3,4,5,6,7  100%      ETS
1                       -         -
2                       -         -
3                       -         -
4                       -         -
5                       -         -
```

```
6                       -          -
7                       -          -
8                       -          -
```

show stack-unit stack-ports pfc details

Displays the PFC configuration applied to ingress traffic on stacked ports, including PFC Operational mode on each unit with the configured priorities, link delay, and number of pause packets sent and received.

Syntax

```
show stack-unit {all | stack-unit} stack-ports {all | port-number} pfc details
```

Parameters

stack-unit	Enter the stack unit.
port-number	Enter the port number.

Command Modes

CONFIGURATION

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Example

```
Dell(conf)# show stack-unit all stack-ports all pfc details

stack unit 0 stack-port all
  Admin mode is On
  Admin is enabled, Priority list is 4-5
  Local is enabled, Priority list is 4-5
  Link Delay 45556 pause quantum
  0 Pause Tx pkts, 0 Pause Rx pkts

stack unit 1 stack-port all
  Admin mode is On
  Admin is enabled, Priority list is 4-5
  Local is enabled, Priority list is 4-5
  Link Delay 45556 pause quantum
  0 Pause Tx pkts, 0 Pause Rx pkts
```

FIP Snooping

In a converged Ethernet network, an Aggregator can operate as an intermediate Ethernet bridge to snoop on Fibre Channel over Ethernet Initialization Protocol (FIP) packets during the login process on Fibre Channel over Ethernet (FCoE) forwarders (FCFs). Acting as a transit FIP snooping bridge, the switch uses dynamically-created ACLs to permit only authorized FCoE traffic to be transmitted between an FCoE end-device and an FCF.

FIP Snooping Commands

The following Dell Networking OS commands are used to configure and verify the FIP snooping feature:

- debug fip-snooping
- show fip-snooping config
- show fip-snooping enode
- show fip-snooping fcf
- show fip-snooping sessions
- show fip-snooping statistics
- show fip-snooping system

clear fip-snooping database interface vlan

Clear FIP snooping information on a VLAN for a specified FCoE MAC address, ENode MAC address, or FCF MAC address, and remove the corresponding ACLs FIP snooping generates.

Syntax

```
clear fip-snooping database interface vlan vlan-id {fcoe-mac-address | enode-mac-address | fcf-mac-address}
```

Parameters

fcoe-mac-address	Enter the FCoE MAC address to be cleared of FIP snooping information.
enode-mac-address	Enter the ENode MAC address to be cleared of FIP snooping information.
fcf-mac-address	Enter the FCF MAC address to be cleared of FIP snooping information.

Command Modes

EXEC Privilege

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

clear fip-snooping statistics

Clears the statistics on the FIP packets snooped on all VLANs, a specified VLAN, or a specified port interface.

Syntax

```
clear fip-snooping statistics [interface vlan vlan-id | interface port-type port/slot | interface port-channel port-channel-number]
```

Parameters

vlan-id	Enter the VLAN ID of the FIP packet statistics to be cleared.
port-type port/slot	Enter the port-type and slot number of the FIP packet statistics to be cleared.

	port-channel-number	Enter the port channel number of the FIP packet statistics to be cleared.
Command Modes	EXEC Privilege	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

feature fip-snooping

Enable FCoE transit and FIP snooping on a switch.

Syntax	`feature fip-snooping` To disable the FCoE transit feature, use the `no feature fip-snooping` command.
Defaults	Disabled
Command Modes	CONFIGURATION
Command History	**Version 9.2(0.0)** Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1 Introduced on the MXL 10/40GbE Switch IO Module.

fip-snooping enable

Enable FIP snooping on all VLANs or on a specified VLAN.

Syntax	`fip-snooping enable` To disable the FIP snooping feature on all or a specified VLAN, use the `no fip-snooping enable` command.
Defaults	FIP snooping is disabled on all VLANs.
Command Modes	• CONFIGURATION • VLAN INTERFACE
Command History	**Version 9.2(0.0)** Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1 Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information	The maximum number of FCFs supported per FIP snooping-enabled VLAN is four. The maximum number of FIP snooping sessions supported per ENode server is 16.

fip-snooping fc-map

Configure the FC-MAP value FIP snooping uses on all VLANs.

Syntax

`fip-snooping fc-map` *`fc-map-value`*

To return the configured FM-MAP value to the default value, use the `no fip-snooping fc-map` command.

Parameters

fc-map-value	Enter the FC-MAP value FIP snooping uses. The range is from 0EFC00 to 0EFCFF.

Defaults **0x0EFC00**

Command Modes

- CONFIGURATION
- VLAN INTERFACE

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

fip-snooping port-mode fcf

Configure the port for bridge-to-FCF links.

Syntax

`fip-snooping port-mode fcf`

To disable the bridge-to-FCF link on a port, use the `no fip-snooping port-mode fcf` command.

Command Modes INTERFACE

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information The maximum number of FCFs supported per FIP snooping-enabled VLAN is four.

iSCSI Optimization

Internet small computer system interface (iSCSI) optimization enables quality-of-service (QoS) treatment for iSCSI storage traffic.

To configure and verify the iSCSI optimization feature, use the following Dell Networking Operating System (OS) commands.

advertise dcbx-app-tlv

Configure DCBX to send iSCSI TLV advertisements.

Syntax	`advertise dcbx-app-tlv iscsi` To disable DCBX iSCSI TLV advertisements, use the `no advertise dcbx-app-tlv iscsi` command.	
Defaults	Disabled.	
Command Modes	PROTOCOL LLDP	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.
Usage Information	You can configure iSCSI TLVs to send either globally or on a specified interface. The interface configuration takes priority over global configuration.	

iscsi aging time

Set the aging time for iSCSI sessions.

Syntax	`iscsi aging time` *time* To remove the iSCSI session aging time, use the `no iscsi aging time` command.	
Parameters	*time*	Enter the aging time for the iSCSI session. The range is from 5 to 43,200 minutes.
Defaults	**10 minutes**	
Command Modes	CONFIGURATION	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

iscsi cos

Set the QoS policy that is applied to the iSCSI flows.

Syntax

```
iscsi cos {enable | disable | dot1p vlan-priority-value
[remark] | dscp dscp-value [remark]}
```

To disable the QoS policy, use the `no iscsi cos dscp` command.

Parameters

enable	Enter the keyword `enable` to allow the application of preferential QoS treatment to iSCSI traffic so that the iSCSI packets are scheduled in the switch with a dot1p priority 4 regardless of the VLAN priority tag in the packet. The default is: the iSCSI packets are handled with dotp1 priority 4 without remark.
disable	Enter the keyword `disable` to disable the application of preferential QoS treatment to iSCSI frames.
dot1p *vlan-priority-value*	Enter the dot1p value of the VLAN priority tag assigned to the incoming packets in an iSCSI session. The range is from 0 to 7. The default is the dot1p value in ingress iSCSI frames is not changed and is the same priority is used in iSCSI TLV advertisements if you did not enter the `iscsi priority-bits` command.
dscp *dscp-value*	Enter the DSCP value assigned to the incoming packets in an iSCSI session. The valid range is from 0 to 63. The default is: the DSCP value in ingress packets is not changed.
remark	Marks the incoming iSCSI packets with the configured dot1p or DSCP value when they egress to the switch. The default is: the dot1and DSCP values in egress packets are not changed.

Defaults The default dot1p VLAN priority value is 4 without the `remark` option.

Command Modes CONFIGURATION

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

iscsi enable

Globally enable iSCSI optimization.

Syntax

```
iscsi enable
```

To disable iSCSI optimization, use the `no iscsi enable` command.

Parameters	***enable***	Enter the keyword `enable` to enable the iSCSI optimization feature.
Defaults	Disabled.	
Command Modes	CONFIGURATION	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.
Usage Information	When you enable the iSCSI feature using the `iscsi enable` command, flow control settings are set to `rx on tx off` on all interfaces.	

iscsi priority-bits

Configure the priority bitmap that advertises in the iSCSI application TLVs.

Syntax	`iscsi priority-bits` To remove the configured priority bitmap, use the `no iscsi priority-bits` command.	
Defaults	**4** (0x10 in the bitmap)	
Command Modes	PROTOCOL LLDP (only on the global, not on the interface)	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

iscsi profile-compellant

Configure the auto-detection of Dell Compellent arrays on a port.

Syntax	`iscsi profile-compellent`	
Defaults	Dell Compellent disk arrays are not detected.	
Command Modes	INTERFACE	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

iscsi target port

Configure the iSCSI target ports and optionally, the IP addresses on which iSCSI communication is monitored.

Syntax	`iscsi target port [`*`tcp-port-2...tcp-port-16`*`]ip-address [`*`ip-address`*`]` To remove the configured iSCSI target ports or IP addresses, use the `no iscsi target port` command.	
Parameters	***tcp-port-2...tcpport - 16***	Enter the tcp-port number of the iSCSI target ports. The `tcp-port-n` is the TCP port number or a list of TCP port numbers on which the iSCSI target listens to requests. Separate port numbers with a comma. The default is **860, 3260**.
	ip-address	(Optional) Enter the ip-address that the iSCSI monitors. The ip-address specifies the IP address of the iSCSI target.
Defaults	**860, 3260**	
Command Modes	CONFIGURATION	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.
Usage Information	You can configure up to 16 target TCP ports on the switch in one command or multiple commands. When you use the `no iscsi target port` command and the TCP port you wish to delete is one bound to a specific IP address, the IP address value must be included in the command.	

Interfaces

The commands in this chapter are supported by Dell Networking Operating System (OS).

This chapter contains the following sections:

- Basic Interface Commands
- Port Channel Commands

Basic Interface Commands

The following commands are for Physical interfaces.

clear counters

Clear the counters used in the `show interfaces` commands for all virtual router redundancy protocol (VRRP) groups, virtual local area networks (VLANs), and physical interfaces, or selected ones.

Syntax

`clear counters` *`interface`*

Parameters

interface (OPTIONAL) Enter any of the following keywords and slot/port or number to clear counters from a specified interface:

- For the management interface on the stack-unit, enter the keyword `management ethernet` followed by slot/port information. The slot and port range is 0.
- For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information.
- For a Port Channel interface, enter the keyword port-channel followed by a number. Range: 1-128

Defaults

Without an interface specified, the command clears all interface counters.

Command Modes

EXEC Privilege

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Example

```
Dell#clear counters
Clear counters on all interfaces [confirm]
```

Related Commands

mac learning-limit — allows aging of MACs even though a learning-limit is configured or disallow station move on learned MACs.

show interfaces — displays information on the interfaces.

description

Assign a descriptive text string to the interface.

Syntax

`description` *`desc_text`*

To delete a description, use the `no description` command.

Parameters	*desc_text*	Enter a text string up to 240 characters long. To use special characters as a part of the description string, you must enclose the whole string in double quotes.
Defaults	none	
Command Modes	INTERFACE	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information

Important Points to Remember:

- Spaces between characters are not preserved after entering this command unless you enclose the entire description in quotation marks ("*desc_text*").
- Entering a text string after the `description` command overwrites any previous text string that you previously configured as the description.
- The `shutdown` and `description` commands are the only commands that you can configure on an interface that is a member of a port-channel.
- Use the `show interfaces description` command to display descriptions configured for each interface.

Related Commands show interfaces description — displays the description field of the interfaces.

flowcontrol

Control how the system responds to and generates 802.3x pause frames on 10G and 40Gig stack units.

Syntax `flowcontrol rx {off | on} tx {off | on} threshold`

Parameters

rx on	Enter the keywords `rx on` to process the received flow control frames on this port. This is the default value for the receive side.
rx off	Enter the keywords `rx off` to ignore the received flow control frames on this port.
tx on	Enter the keywords `tx on` to send control frames from this port to the connected device when a higher rate of traffic is received. This is the default value on the send side.
tx off	Enter the keywords `tx off` so that flow control frames are not sent from this port to the connected device when a higher rate of traffic is received.

Defaults

- `rx off`

- `tx off`

Command Modes

INTERFACE

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information

The globally assigned 48-bit Multicast address 01-80-C2-00-00-01 is used to send and receive pause frames. To allow full-duplex flow control, stations implementing the pause operation instruct the MAC to enable the reception of frames with a destination address equal to this multicast address.

The pause:

- Starts when *either* the packet pointer or the buffer threshold is met (whichever is met first). When the discard threshold is met, packets are dropped.
- Ends when *both* the packet pointer and the buffer threshold fall below 50% of the threshold settings.

The *discard threshold* defines when the interface starts dropping the packet on the interface. This may be necessary when a connected device does not honor the flow control frame sent by the switch. The discard threshold should be larger than the *buffer threshold* so that the buffer holds at least hold at least three packets.

On 4–port 10G stack units: Changes in the flow-control values may not be reflected automatically in the `show interface` output for 10G interfaces. This is because 10G interfaces do not support auto-negotiation.

Important Points to Remember

- Do not enable `tx pause` when buffer carving is enabled. For information and assistance, consult Dell Networking TAC.
- Asymmetric flow control (`rx on tx off`, or `rx off tx on`) setting for the interface port less than 100 Mb/s speed is not permitted. The following error is returned:

  ```
  Can't configure Asymmetric flowcontrol when speed <1G,
  config ignored
  ```

- The only configuration applicable to half duplex ports is `rx off tx off`. The following error is returned:

  ```
  Cannot configure Asymmetric flowcontrol when speed <1G,
  config ignored>
  ```

- You cannot configure half duplex when the flow control configuration is on (default is `rx on tx on`). The following error is returned: `Cannot configure half duplex when flowcontrol is on, config ignored`

NOTE: The flow control must be off (`rx off tx off`) before configuring the half duplex.

Example (partial)

```
Dell(conf-if-tengig-0/1)#show config
!
interface TenGigabitEthernet 0/1
no ip address
switchport
no negotiation auto
flowcontrol rx off tx on
no shutdown
...
```

Example (Values)

This Example shows how the Dell Networking OS negotiates the flow control values between two Dell Networking chassis connected back-to-back using 1G copper ports.

```
Configured

LocRxConf LocTxConf RemoteRxConf RemoteTxConf
off       off        off           off
                     off           on
                     on            off
                     on            on

off       on         off           off
                     off           on
                     on            off
                     on            on

on        off        off           off
                     off           on
                     on            off
                     on            on

on        on         off           off
                     off           on
                     on            off
                     on            on

LocNegRx LocNegTx RemNegRx RemNegTx
off      off      off      off
off      off      off      off
off      off      off      off
off      off      off      off

off      off      off      off
off      off      off      off
off      on       on       off
off      off      off      off

off      off      off      off
on       off      off      on
on       on       on       on
on       on       on       on

off      off       off     off
off      off       off     off
on       on        on      on
on       on        on      on
```

Related Commands	show running-config — displays the flow configuration parameters (non-default values only). show interfaces — displays the negotiated flow control parameters.

interface ManagementEthernet

Configure the Management port on the system.

Syntax	`interface ManagementEthernet` *`slot/port`*	
Parameters	***slot/port***	Enter the keyword `ManagementEthernet`, then the slot number 0 and port number zero (0).
Defaults	Not configured.	
Command Modes	CONFIGURATION	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.
Usage Information	You cannot delete a Management port. The Management port is enabled by default (`no shutdown`). To assign an IP address to the Management port, use the `ip address` command.	
Example	`Dell(conf)#interface managementethernet 0/0` `Dell(conf-if-ma-0/0)#`	

interface

Configure a physical interface on the switch.

Syntax	`interface` *`interface`*	
Parameters	***interface***	Enter one of the following keywords and slot/port or number information: • For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` then the slot/port information. • For a 40-Gigabit Ethernet interface, enter the keyword `fortyGigE` then the slot/port information. • For a Fibre Channel interface, enter the keyword `FibreChannel`, then the slot/port information.

Defaults	Not configured.
Command Modes	CONFIGURATION
Command History	**Version 9.4(0.0)** Added the support for interfaces. **Version 9.2(0.0)** Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only. **Version 8.3.16.1** Introduced on the MXL 10/40GbE Switch IO Module.
Usage Information	You cannot delete a physical interface. By default, physical interfaces are disabled (`shutdown`) and are in Layer 3 mode. To place an interface in mode, ensure that the interface's configuration does not contain an IP address and enter the `Port Channel Commands` command. The tunnel interface operates as an ECMP (equal cost multi path) only when the next hop to the tunnel destination is over a physical interface. If you select any other interface as the next hop to the tunnel destination, the tunnel interface does not operate as an ECMP.
Example	`Dell(conf)#interface tengig 0/1` `Dell(conf-if-tengig-0/0)#exit#`
Related Commands	interface port-channel — configures a port channel. interface vlan — configures a VLAN. show interfaces — displays the interface configuration.

interface vlan

Configure the default VLAN to enable Static or DCHP IP configuration

Syntax	`interface vlan`*`def-vlan-id`*
Parameters	***def-vlan-id*** Enter 1 for the default VLAN.
Defaults	Not configured
Command Modes	CONFIGURATION
Command History	**Version 8.3.17.0** Supported on the M I/O Aggregator.
Usage Information	For more information about VLANs and the commands to configure them, refer to Virtual LAN (VLAN) Commands.

Example	`Dell(conf)#int vlan 1` `Dell(conf-if-vl-1)#`
Related commands	show vlan — Displays the current VLAN configuration on the switch. vlan tagged — Adds a Layer 2 interface to a VLAN as a tagged interface. vlan untagged — Adds a Layer 2 interface to a VLAN as an untagged interface.

interface range

This command permits configuration of a range of interfaces to which subsequent commands are applied (bulk configuration). Using the `interface range` command, you can enter identical commands for a range of interface.

Syntax `interface range` *interface*, *interface*,...

Parameters

interface, interface,...	Enter the keywords `interface range` and one of the interfaces — slot/port, port-channel, or VLAN number. Select the range of interfaces for bulk configuration. You can enter up to six comma-separated ranges. Spaces are not required between the commas. Comma-separated ranges can include VLANs, port-channels, and physical interfaces. Slot/Port information must contain a space before and after the dash. For example, `interface range gigabitethernet 0/1 - 5` is valid; `interface range gigabitethernet 0/1-5` is NOT valid. • For a Port Channel interface, enter the keywords `port-channel` then a number. The range is from 1 to 128. • For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` then the slot/port information. • For a 40-Gigabit Ethernet interface, enter the keyword `fortyGigE` then the slot/port information. • For a VLAN interface, enter the keyword `vlan` then a number from 1 to 4094.

Defaults	none
Command Modes	CONFIGURATION

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information When creating an interface range, interfaces appear in the order they are entered; they are not sorted. The command verifies that interfaces are present (physical) or configured (logical).

Important Points to Remember:

- Bulk configuration is created if at least one interface is valid.
- Non-existing interfaces are excluded from the bulk configuration with a warning message.
- The `interface range` prompt includes interface types with slot/port information for valid interfaces. The prompt allows for a maximum of 32 characters. If the bulk configuration exceeds 32 characters, it is represented by an ellipsis (...).
- When the `interface range` prompt has multiple port ranges, the smaller port range is excluded from the prompt.
- If overlapping port ranges are specified, the port range is extended to the smallest start port and the biggest end port.

Example (Bulk)

```
Dell(conf)#interface range so 2/0-1, te 10/0, gi 3/0, fa 0/0
% Warning: Non-existing ports (not configured) are ignored by
interface-range
```

Example (Multiple Ports)

```
Dell(conf)#interface range gi 2/0 - 23, gi 2/1 - 10
Dell(conf-if-range-gi-2/0-23#
```

Example (Overlapping Ports)

```
Dell(conf)#interface range gi 2/1 - 11, gi 2/1 - 23
Dell(conf-if-range-gi-2/1-23#
```

Usage Information

Only VLAN and port-channel interfaces created using the `interface vlan` and `interface port-channel` commands can be used in the `interface range` command.

Use the `show running-config` command to display the VLAN and port-channel interfaces. VLAN or port-channel interfaces that are not displayed in the `show running-config` command cannot be used with the bulk configuration feature of the `interface range` command. You cannot create virtual interfaces (VLAN, Port-channel) using the `interface range` command.

NOTE: If a range has VLAN, physical, port-channel, and SONET interfaces, only commands related to physical interfaces can be bulk configured. To configure commands specific to VLAN or port-channel, only those respective interfaces should be configured in a particular range.

Example (Single Range)

This example shows a single range bulk configuration.

```
Dell(config)# interface range gigabitethernet 5/1 - 23
Dell(config-if-range)# no shutdown
Dell(config-if-range)#
```

Example (Multiple Range)

This example shows how to use commas to add different interface types to the range enabling all Gigabit Ethernet interfaces in the range 5/1 to 5/23 and both Ten-Gigabit Ethernet interfaces 1/1 and 1/2.

```
Dell(config-if)# interface range gigabitethernet5/1-23,
tengigabitethernet1/1-2
```

```
Dell(config-if-range)# no shutdown
Dell(config-if-range)#
```

Example (Multiple Range)

This example shows how to use commas to add SONET, VLAN, and port-channel interfaces to the range.

```
Dell(config-if)# interface range gigabitethernet5/1-23,
tengigabitethernet1/1-2,
Vlan 2-100, Port 1-25
Dell(config-if-range)# no shutdown
Dell(config-if-range)#
```

Related Commands

interface port-channel — configures a port channel group.

interface vlan — configures a VLAN interface.

keepalive

Send keepalive packets periodically to keep an interface alive when it is not transmitting data.

Syntax

`keepalive [seconds]`

To stop sending keepalive packets, use the `no keepalive` command.

Parameters

seconds	(OPTIONAL) For interfaces with PPP encapsulation enabled, enter the number of seconds between keepalive packets. The range is from 0 to 23767. The default is **10 seconds**.

Defaults

Enabled.

Command Modes

INTERFACE

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information

When you configure `keepalive`, the system sends a self-addressed packet out of the configured interface to verify that the far end of a WAN link is up. When you configure `no keepalive`, the system does not send keepalive packets and so the local end of a WAN link remains up even if the remote end is down.

mtu

Set the link maximum transmission unit (MTU) (frame size) for an Ethernet interface.

Syntax

`mtu value`

To return to the default MTU value, use the `no mtu` command.

Parameters

value	Enter a maximum frame size in bytes. The range is from 594 to 9252. MXL Switch Range is from 594 to 12000. The default is **1554**.

Defaults **1554**

Command Modes INTERFACE

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information

If the packet includes a Layer 2 header, the difference between the link MTU and IP MTU (`ip mtu` command) must be enough bytes to include the Layer 2 header.

- The IP MTU is adjusted automatically when you configure the Layer 2 MTU with the `mtu` command.

When you enter the `no mtu` command, The Dell Networking OS reduces the IP MTU value to 1536 bytes.

Link MTU and IP MTU considerations for port channels and VLANs are as follows.

port channels:

- All members must have the same link MTU value and the same IP MTU value.
- The port channel link MTU and IP MTU must be less than or equal to the link MTU and IP MTU values configured on the channel members. For example, if the members have a link MTU of 2100 and an IP MTU 2000, the port channel's MTU values cannot be higher than 2100 for link MTU or 2000 bytes for IP MTU.

VLANs:

- All members of a VLAN must have same IP MTU value.
- Members can have different Link MTU values. Tagged members must have a link MTU 4 bytes higher than untagged members to account for the packet tag.
- The VLAN link MTU and IP MTU must be less than or equal to the link MTU and IP MTU values configured on the VLAN members. For example, the VLAN contains tagged members with Link MTU of 1522 and IP MTU of 1500 and untagged members with Link MTU of 1518 and IP MTU of 1500. The VLAN's Link MTU cannot be higher than 1518 bytes and its IP MTU cannot be higher than 1500 bytes.

The following shows the difference between Link MTU and IP MTU.

Layer 2 Overhead	Link MTU and IP MTU Delta
Ethernet (untagged)	18 bytes
VLAN Tag	22 bytes

Layer 2 Overhead	Link MTU and IP MTU Delta
Untagged Packet with VLAN-Stack Header	22 bytes
Tagged Packet with VLAN-Stack Header	26 bytes

negotiation auto

Enable auto-negotiation on an interface.

Syntax

`negotiation auto`

To disable auto-negotiation, use the `no negotiation auto` command.

Defaults

Enabled.

Command Modes

INTERFACE

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information

The `no negotiation auto` command is only available if you first manually set the speed of a port to **10Mbits** or **100Mbits**.

The `negotiation auto` command provides a `mode` option for configuring an individual port to forced-master/forced slave after you enable auto-negotiation.

If you do not use the `mode` option, the default setting is **slave**. If you do not configure forced-master or forced-slave on a port, the port negotiates to either a master or a slave state. Port status is one of the following:

- Forced-master
- Force-slave
- Master
- Slave
- Auto-neg Error — typically indicates that both ends of the node are configured with forced-master or forced-slave.

CAUTION: Ensure that one end of your node is configured as forced-master and one is configured as forced-slave. If both are configured the same (that is, forced-master or forced-slave), the `show interfaces` command flaps between an auto-neg-error and forced-master/slave states.

You can display master/slave settings with the `show interfaces` command.

Example (Master/Slave)

```
Dell(conf)# int tengig 0/0
Dell(conf-if)#neg auto
Dell(conf-if-autoneg)# ?

end          Exit from configuration mode
exit         Exit from autoneg configuration mode
mode         Specify autoneg mode
no           Negate a command or set its defaults
show         Show autoneg configuration information
Dell(conf-if-autoneg)#mode ?
forced-master Force port to master mode
forced-slave Force port to slave mode
Dell(conf-if-autoneg)#
```

Example (Master/Slave, partial)

```
Dell#show interfaces configured
TenGigabitEthernet 13/18 is up, line protocol is up
Hardware is Dell Force10Eth, address is 00:01:e8:05:f7:fc
   Current address is 00:01:e8:05:f7:fc
Interface index is 474791997
Internet address is 1.1.1.1/24
MTU 1554 bytes, IP MTU 1500 bytes
LineSpeed 1000 Mbit, Mode full duplex, Master
ARP type: ARPA, ARP Timeout 04:00:00
Last clearing of "show interfaces" counters 00:12:42
Queueing strategy: fifo
Input Statistics:
...
```

User Information

Both sides of the link must have auto-negotiation enabled or disabled for the link to come up.

The following details the possible speed and auto-negotiation combinations for a line between two 10/100/1000 Base-T Ethernet interfaces.

Port 0

- auto-negotiation enabled* speed 1000 or auto
- auto-negotiation enabled speed 100
- auto-negotiation disabled speed 100
- auto-negotiation disabled speed 100
- auto-negotiation enabled* speed 1000 or auto

Port 1

- auto-negotiation enabled* speed 1000 or auto
- auto-negotiation enabled speed 100
- auto-negotiation disabled speed 100
- auto-negotiation enabled speed 100
- auto-negotiation disabled speed 100

Link Status Between Port 1 and Port 2

- Up at 1000 Mb/s
- Up at 100 Mb/s

- Up at 100 Mb/s
- Down
- Down

* You cannot disable auto-negotiation when the speed is set to 1000 or auto.

Related Commands speed (for 1000/10000 interfaces) — sets the link speed to 1000, 10000, or auto-negotiate the speed.

portmode hybrid

To accept *both* tagged and untagged frames, set a physical port or port-channel. A port configured this way is identified as a hybrid port in report displays.

Syntax

```
portmode hybrid
```

To return a port to accept *either* tagged or untagged frames (non-hybrid), use the `no portmode hybrid` command.

Defaults non-hybrid

Command Modes INTERFACE (conf-if-*interface-slot/port*)

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information

The following describes the `interface` command shown in the following example. This example sets a port as hybrid, makes the port a tagged member of VLAN 20, and an untagged member of VLAN 10, which becomes the native VLAN of the port. The port now accepts:

- untagged frames and classify them as VLAN 10 frames
- VLAN 20 tagged frames

The following describes the `do show interfaces` command shown in the following example. This example shows output with "Hybrid" as the newly added value for 802.1QTagged. The options for this field are:

- True — port is tagged
- False — port is untagged
- Hybrid — port accepts both tagged and untagged frames

The following describes the `interface vlan` command shown in the following example. This example shows unconfiguration of the hybrid port using the `no portmode hybrid` command.

NOTE: Remove all other configurations on the port before you can remove the hybrid configuration from the port.

Example

```
Dell(conf)#int tengigabitethernet 0/2
Dell(conf-if-te-0/2)#00:18:21: %STKUNIT0-M:CP %DIFFSERV-4-
DSM_DCBX_MANUAL_INCOMPATIBLE_CONFIG: Incompatible PFC config
received on MANUAL interface Te 0/7 - repeated 59 times

Dell(conf-if-te-0/2)#
Dell(conf-if-te-0/2)#
Dell(conf-if-te-0/2)#vlan tagged 10
Dell(conf-if-te-0/2)#vlan untagged 20
Dell(conf-if-te-0/2)#do show interfaces switchport
tengigabitethernet 0/2

Codes:  U - Untagged, T - Tagged
        x - Dot1x untagged, X - Dot1x tagged
        G - GVRP tagged, M - Trunk, H - VSN tagged
        i - Internal untagged, I - Internal tagged, v - VLT
untagged, V - VLT tagged

Name: TenGigabitEthernet 0/2
802.1QTagged: Hybrid
IO-AGG port mode: Admin VLANs enabled
Vlan membership:
Q       Vlans
U       20
T       10

Native VlanId:    20.
Dell(conf-if-te-0/2)#
```

Example (tagged hybrid)

```
Dell(conf)#interface tengig 0/20
Dell(conf-if-te-0/20)#no shut
Dell(conf-if-te-0/20)#portmode hybrid
Dell(conf-if-te-0/20#sw
Dell(conf-if-te-0/20)#int vlan 10
Dell(conf-if-vl-10)#int tengig 0/20
Dell(conf-if-vl-20)# untag tengig 0/20

Dell (conf-if-vl-20)#

Dell(conf)#do show interfaces switchport tengigabitethernet
3/20

Codes: U - Untagged, T - Tagged
       x - Dot1x untagged, X - Dot1x tagged
       G - GVRP tagged, M - Trunk, H - VSN tagged
       i - Internal untagged, I - Internal tagged, v - VLT
untagged,
       V - VLT tagged

Name: TenGigabitEthernet 3/20

802.1QTagged: Hybrid
Vlan membership:
Q   Vlans
U   20
T   10

Native VlanId: 20.

Dell(conf)#
```

Example (unconfigure the hybrid port)

```
Dell(conf-if-te-0/2)#no vlan tagged 10
Dell(conf-if-te-0/2)#no vlan untagged
Dell(conf-if-te-0/2)#do show interfaces switchport
tengigabitethernet 0/2

Codes:  U - Untagged, T - Tagged
        x - Dot1x untagged, X - Dot1x tagged
        G - GVRP tagged, M - Trunk, H - VSN tagged
        i - Internal untagged, I - Internal tagged, v - VLT
untagged, V - VLT tagged

Name: TenGigabitEthernet 0/2
802.1QTagged: Hybrid
IO-AGG port mode: Admin VLANs enabled
Vlan membership:
Q       Vlans
U       1

Native VlanId:    1.


Dell(conf-if-te-0/2)#
```

Related Commands

show interfaces switchport — displays the configuration of switchport (Layer 2) interfaces on the switch.

vlan-stack trunk — specifies an interface as a trunk port to the Stackable VLAN network.

stack-unit portmode

Split a single 40G port into 4-10G ports on the MXL switch.

Syntax

```
stack-unit stack-unit port number portmode quad
```

Parameters

stack-unit Enter the stack member unit identifier of the stack member to reset. The range is 0 to 5.

NOTE: The MXL switch commands accept Unit ID numbers from 0 to 5, though the MXL switch supports stacking up to three units only with the Dell Networking OS version 8.3.7.1.

number Enter the port number of the 40G port to be split. Enter one of the following port numbers for the MXL switch: 48, 52, 56, or 60.

Defaults Disabled.

Command Modes CONFIGURATION

Command History

Version 9.2(0.0) Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.

Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information

Splitting a 40G port into 4x10G port is supported on standalone and stacked units.

- You cannot use split ports as stack-link to stack an MXL Switch.
- The split ports MXL switch unit cannot be a part of any stacked system.
- The unit number with the split ports must be the default (stack-unit 0).
- This set up can be verified using `show system brief` command. If the unit ID is different than 0, it must be renumbered to 0 before ports are split by using the `stackunit id renumber 0` command in EXEC mode.

The quad port must be in a default configuration before it can be split into 4x10G ports. The 40G port is lost in the config when the port is split, so be sure that the port is also removed from other L2/L3 feature configurations.

The system must be reloaded after issuing the CLI for the change to take effect.

Port Channel Commands

A link aggregation group (LAG) is a group of links that appear to a MAC client as if they were a single link according to IEEE 802.3ad. In the Dell Networking OS, a LAG is referred to as a Port Channel.

- For the MXL switch, the maximum port channel ID is 128 and the maximum members per port channel is 16.

Because each port can be assigned to only one Port Channel, and each Port Channel must have at least one port, some of those nominally available Port Channels might have no function because they could have no members if there are not enough ports installed. In the MXL 10/40GbE Switch IO Module, those ports could be provided by stack members.

NOTE: The Dell Networking OS implementation of LAG or Port Channel requires that you configure a LAG on both switches manually. For information about Dell Networking OS link aggregation control protocol (LACP) for dynamic LAGs, refer to the *Link Aggregation Control Protocol (LACP)* chapter. For more information about configuring and using Port Channels, refer to the *Dell Networking OS Configuration Guide*.

channel-member

Add an interface to the Port Channel, while in INTERFACE PORTCHANNEL mode.

Syntax

`channel-member` *interface*

To delete an interface from a Port Channel, use the `no channel-member` *interface* command.

Parameters

interface	(OPTIONAL) Enter any of the following keywords and slot/port or number information: • For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` then the slot/port information. • For a 40-Gigabit Ethernet interface, enter the keyword `fortyGigE` then the slot/port information.

Defaults

Not configured.

Command Modes

INTERFACE PORTCHANNEL

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information

Use the `interface port-channel` command to access this command.

You cannot add an interface to a Port Channel if the interface contains an IP address in its configuration.

Link MTU and IP MTU considerations for Port Channels are:

- All members must have the same link MTU value and the same IP MTU value.
- The Port Channel link MTU and IP MTU must be less than or equal to the link MTU and IP MTU values configured on the channel members. For example, if the members have a link MTU of 2100 and an IP MTU 2000, the Port Channel's MTU values cannot be higher than 2100 for link MTU or 2000 bytes for IP MTU.

When an interface is removed from a Port Channel with the `no channel-member` command, the interface reverts to its configuration prior to joining the Port Channel.

An interface can belong to only one Port Channel.

You can add up to 16 interfaces to a Port Channel on the MXL switch. The interfaces can be located on different line cards but must be the same physical type and speed (for example, all 10-Gigabit Ethernet interfaces). However, you can combine 100/1000 interfaces and GE interfaces in the same Port Channel.

If the Port Channel contains a mix of interfaces with 100 Mb/s speed and 1000 Mb/s speed, the software disables those interfaces whose speed does not match the speed of the first interface configured and enabled in the Port Channel. If that first interface goes down, the Port Channel does not change its designated speed; disable and re-enable the Port Channel or change the order of the channel members configuration to change the designated speed. If the Port Channel contains a mix of interfaces with 100 Mb/s speed and 1000 Mb/s speed, the software disables those interfaces whose speed does not match the speed of the first interface configured and enabled in the Port Channel. If that first interface goes down, the Port Channel does not change its designated speed; disable and re-enable the Port Channel or change the order of the channel members configuration to change the designated speed. For more information about Port Channels, refer to the *Dell Networking OS Configuration Guide*.

Related Commands

interface port-channel — creates a Port Channel interface.

interface port-channel

Create a Port Channel interface, which is a link aggregation group (LAG) containing 16 physical interfaces on the XML switch.

Syntax

`interface port-channel` *`channel-number`*

To delete a Port Channel, use the `no interface port-channel` *`channel-number`* command.

Parameters

channel-number	For a Port Channel interface, enter the keywords `port-channel` then a number. The range is from 1 to 128.

Defaults

Not configured.

Command Modes

CONFIGURATION

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information

Port Channel interfaces are logical interfaces and can be either in Layer 2 mode (by using the `switchport` command) or Layer 3 mode (by configuring an IP address). You can add a Port Channel in Layer 2 mode to a VLAN.

A Port Channel can contain both 100/1000 interfaces and GE interfaces. Based on the first interface configured in the Port Channel and enabled, the Dell Networking OS determines if the Port Channel uses 100 Mb/s or 1000 Mb/s as the common speed. For more information, refer to channel-member.

If the line card is in a Jumbo mode chassis, you can also configure the `mtu` and `ip mtu` commands. The Link MTU and IP MTU values configured on the channel members must be greater than the Link MTU and IP MTU values configured on the Port Channel interface.

NOTE: In a Jumbo-enabled system, you must configure all members of a Port Channel with the same link MTU values and the same IP MTU values.

Example

```
Dell(conf)#int port-channel 2
Dell(conf-if-po-2)#
```

Related Commands

channel-member — adds a physical interface to the LAG.

interface — configures a physical interface.

interface vlan — configures a VLAN.

minimum-links

Configure the minimum number of links in a LAG (Port Channel) that must be in "oper up" status for the LAG to be also in "oper up" status.

Syntax	`minimum-links` *number*	
Parameters	***number***	Enter the number of links in a LAG that must be in "oper up" status. The range is from 1 to 16. The default is **1**.
Defaults	**1**	
Command Modes	INTERFACE	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.
Usage Information	If you use this command to configure the minimum number of links in a LAG that must be in "oper up" status, the LAG must have at least that number of "oper up" links before it can be declared as up. For example, if the required minimum is four, and only three are up, the LAG is considered down.	

Internet Group Management Protocol (IGMP)

The IGMP commands are supported by the Dell Networking operating software on the Aggregator.

This chapter contains the following sections:

- IGMP Commands
- IGMP Snooping Commands

IGMP Commands

Dell Networking OS supports IGMPv1/v2/v3 and is compliant with RFC-3376.

Important Points to Remember

- IGMPv2 is the default version of IGMP on interfaces. You can configure IGMPv3 on interfaces. It is backward compatible with IGMPv2.
- There is no hard limit on the maximum number of groups supported.
- IGMPv3 router interoperability with IGMPv2 and IGMPv1 routers on the same subnet is not supported.
- An administrative command (`ip igmp version`) is added to manually set the IGMP version.
- All commands previously used for IGMPv2 are compatible with IGMPv3.

ip igmp group-join-limit

To limit the number of IGMP groups that can be joined in a second, use this feature.

Syntax `ip igmp group-join-limit number`

Parameters

number	Enter the number of IGMP groups permitted to join in a second. The range is from 1 to 10000.

Defaults none

Command Modes CONFIGURATION (conf-if-*interface-slot/port*)

Command History This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 9.0.2.0	Introduced on the S6000.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.11.1	Introduced on the Z9000.
Version 8.3.7.0	Introduced on the S4810.
Version 7.8.1.0	Introduced on the C-Series and S-Series.
Version 7.6.1.0	Introduced on the E-Series.

ip igmp querier-timeout

Change the interval that must pass before a multicast router decides that there is no longer another multicast router that should be the querier.

Syntax `ip igmp querier-timeout seconds`

To return to the default value, use the `no ip igmp querier-timeout` command.

Parameters

seconds	Enter the number of seconds the router must wait to become the new querier. The range is from 60 to 300. The default is **125 seconds**.

Defaults **125 seconds**

Command Modes INTERFACE

Command History

This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 9.0.2.0	Introduced on the S6000.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.11.1	Introduced on the Z9000.
Version 8.3.7.0	Introduced on the S4810.
Version 7.8.1.0	Introduced on the S-Series.
Version 7.7.1.0	Introduced on the C-Series.
Version 7.6.1.0	Introduced on the S-Series in Interface VLAN mode only to enable the system to act as an IGMP Proxy Querier.
Version 7.5.1.0	Introduced on the C-Series in Interface VLAN mode only to enable the system to act as an IGMP Proxy Querier.
E-Series legacy command.	

ip igmp query-interval

Change the transmission frequency of IGMP general queries the Querier sends.

Syntax

`ip igmp query-interval` *seconds*

To return to the default values, use the `no ip igmp query-interval` command.

Parameters

seconds	Enter the number of seconds between queries sent out. The range is from 1 to 18000. The default is **60 seconds**.

Defaults

60 seconds

Command Modes

INTERFACE

Command History

This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.

Version 9.0.2.0	Introduced on the S6000.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.11.1	Introduced on the Z9000.
Version 8.3.7.0	Introduced on the S4810.
Version 7.8.1.0	Introduced on the S-Series.
Version 7.7.1.0	Introduced on the C-Series.
Version 7.6.1.0	Introduced on the S-Series in Interface VLAN mode only to enable the system to act as an IGMP Proxy Querier.
Version 7.5.1.0	Introduced on the C-Series in Interface VLAN mode only to enable the system to act as an IGMP Proxy Querier.
E-Series legacy command.	

ip igmp query-max-resp-time

Set the maximum query response time advertised in general queries.

Syntax

```
ip igmp query-max-resp-time seconds
```

To return to the default values, use the `no ip igmp query-max-resp-time` command.

Parameters

seconds	Enter the number of seconds for the maximum response time. The range is from 1 to 25. The default is **10 seconds**.

Defaults **10 seconds**

Command Modes INTERFACE

Command History This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 9.0.2.0	Introduced on the S6000.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.11.1	Introduced on the Z9000.
Version 8.3.7.0	Introduced on the S4810.
Version 7.6.1.0	Introduced on the S-Series.

Version 7.5.1.0	Introduced on the C-Series.
Version 7.6.1.0	Introduced on the S-Series in Interface VLAN mode only to enable the system to act as an IGMP Proxy Querier.
Version 7.5.1.0	Introduced on the C-Series in Interface VLAN mode only to enable the system to act as an IGMP Proxy Querier.
E-Series legacy command.	

ip igmp version

Manually set the version of the router to IGMPv2 or IGMPv3.

Syntax `ip igmp version {2 | 3}`

Parameters

2	Enter the number 2 to set the IGMP version number to IGMPv2.
3	Enter the number 3 to set the IGMP version number to IGMPv3.

Defaults **2** (that is, IGMPv2)

Command Modes INTERFACE

Command History This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.11.1	Introduced on the Z9000.
Version 8.3.7.0	Introduced on the S4810.
Version 7.8.1.0	Introduced on the S-Series.
Version 7.7.1.0	Introduced on the C-Series.
Version 7.5.1.0	Introduced on the E-Series.

IGMP Snooping Commands

Dell Networking OS supports IGMP Snooping version 2 and 3 on all Dell Networking systems.

Important Points to Remember for IGMP Snooping

- Dell Networking OS supports version 1, version 2, and version 3 hosts.
- Dell Networking OS IGMP snooping implementation is based on IP multicast address (not based on Layer 2 multicast mac address) and the IGMP snooping entries are in Layer 3 flow table not in Layer 2 forwarding information base (FIB).
- Dell Networking OS IGMP snooping implementation is based on draft-ietf-magma-snoop-10.
- Dell Networking OS supports IGMP snooping on JUMBO-enabled cards.
- IGMP snooping is not enabled by default on the switch.
- A maximum of 1800 groups and 600 VLAN are supported.
- IGMP snooping is not supported on a default VLAN interface.
- IGMP snooping is not supported over VLAN-Stack-enabled VLAN interfaces (you must disable IGMP snooping on a VLAN interface before configuring VLAN-Stack-related commands).

ip igmp snooping enable

Enable IGMP snooping on all or a single VLAN. This command is the master on/off switch to enable IGMP snooping.

Syntax

```
ip igmp snooping enable
```

To disable IGMP snooping, use the `no ip igmp snooping enable` command.

Defaults

Disabled.

Command Modes

- CONFIGURATION
- INTERFACE VLAN

Command History

This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 9.0.2.0	Introduced on the S6000.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.11.1	Introduced on the Z9000.
Version 8.3.7.0	Introduced on the S4810.
Version 7.6.1.0	Introduced on the S-Series.
Version 7.5.1.0	Introduced on the C-Series.

	E-Series legacy command
Usage Information	To enable IGMP snooping, enter this command. When you enable this command from CONFIGURATION mode, IGMP snooping enables on all VLAN interfaces (except the default VLAN). **NOTE:** Execute the `no shutdown` command on the VLAN interface for IGMP Snooping to function.
Related Commands	shutdown — (no shutdown) activates an interface.

ip igmp snooping fast-leave

Enable IGMP snooping fast-leave for this VLAN.

Syntax	`ip igmp snooping fast-leave` To disable IGMP snooping fast leave, use the `no igmp snooping fast-leave` command.
Defaults	Not configured.
Command Modes	INTERFACE VLAN — (conf-if-vl-*n*)
Command History	This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*. The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 9.0.2.0	Introduced on the S6000.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.11.1	Introduced on the Z9000.
Version 8.3.7.0	Introduced on the S4810.
Version 7.6.1.0	Introduced on the S-Series.
Version 7.5.1.0	Introduced on the C-Series.
E-Series legacy command.	

Usage Information	Queriers normally send some queries when a leave message is received prior to deleting a group from the membership database. There may be situations when you require a fast deletion of a group. When you enable IGMP fast leave

processing, the switch removes an interface from the multicast group as soon as it detects an IGMP version 2 leave message on the interface.

ip igmp snooping last-member-query-interval

The last member query interval is the maximum response time inserted into Group-Specific queries sent in response to Group-Leave messages.

Syntax

`ip igmp snooping last-member-query-interval` *`milliseconds`*

To return to the default value, use the `no ip igmp snooping last-member-query-interval` command.

Parameters

milliseconds	Enter the interval in milliseconds. The range is from 100 to 65535. The default is **1000 milliseconds**.

Defaults

1000 milliseconds

Command Modes

INTERFACE VLAN

Command History

This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 9.0.2.0	Introduced on the S6000.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.11.1	Introduced on the Z9000.
Version 8.3.7.0	Introduced on the S4810.
Version 7.6.1.0	Introduced on the S-Series.
Version 7.5.1.0	Introduced on the C-Series.
E-Series legacy command	

Usage Information

This last-member-query-interval is also the interval between successive Group-Specific Query messages. To change the last-member-query interval, use this command.

ip igmp snooping mrouter

Statically configure a VLAN member port as a multicast router interface.

Syntax

`ip igmp snooping mrouter interface` *`interface`*

To delete a specific multicast router interface, use the `no igmp snooping mrouter interface` *interface* command.

Parameters

interface *interface*	Enter the following keywords and slot/port or number information: • For a 100/1000 Ethernet interface, enter the keyword `gigabitethernet` followed by the slot/port information. • For a 1-Gigabit Ethernet interface, enter the keyword `gigabitethernet` followed by the slot/port information. • For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` then the slot/port information. • For a 40-Gigabit Ethernet interface, enter the keyword `fortyGigE` then the slot/port information. • For a Port Channel interface, enter the keywords `port-channel` then a number. For the C-Series and S-Series, the range is from 1 to 128.

Defaults Not configured.

Command Modes INTERFACE VLAN — (conf-if-vl-*n*)

Command History This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 9.0.2.0	Introduced on the S6000.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.11.1	Introduced on the Z9000.
Version 8.3.7.0	Introduced on the S4810.
Version 7.6.1.0	Introduced on the S-Series.
Version 7.5.1.0	Introduced on the C-Series.
E-Series legacy command.	

Usage Information Dell Networking OS provides the capability of statically configuring the interface to which a multicast router is attached. To configure a static connection to the multicast router, enter the `ip igmp snooping mrouter interface` command

in the VLAN context. The interface to the router must be a part of the VLAN where you are entering the command.

ip igmp snooping querier

Enable IGMP querier processing for the VLAN interface.

Syntax

`ip igmp snooping querier`

To disable IGMP querier processing for the VLAN interface, use the `no ip igmp snooping querier` command.

Defaults

Not configured.

Command Modes

INTERFACE VLAN — (conf-if-vl-*n*)

Command History

This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 9.0.2.0	Introduced on the S6000.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.11.1	Introduced on the Z9000.
Version 8.3.7.0	Introduced on the S4810.
Version 7.6.1.0	Introduced on the S-Series.
Version 7.5.1.0	Introduced on the C-Series.
E-Series legacy command	

Usage Information

This command enables the IGMP switch to send General Queries periodically. This behavior is useful when there is no multicast router present in the VLAN because the multicast traffic is not routed. Assign an IP address to the VLAN interface for the switch to act as a querier for this VLAN.

Layer 2

This chapter describes commands to configure Layer 2 features.

This chapter contains:

- MAC Addressing Commands

MAC Addressing Commands

The following commands are related to configuring, managing, and viewing MAC addresses.

mac-address-table aging-time

Specify an aging time for MAC addresses to remove from the MAC address table.

Syntax	`mac-address-table aging-time` *`seconds`*	
	To delete the configured aging time, use the `no mac-address-table aging-time` *`seconds`* command.	
Parameters	***seconds***	Enter either zero (0) or a number as the number of seconds before MAC addresses are relearned. To disable aging of the MAC address table, enter `0`. The range is from 10 to 1000000. The default is **1800 seconds**.
Defaults	**1800 seconds**	
Command Modes	CONFIGURATION	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

mac-address-table static

Associate specific MAC or hardware addresses to an interface and virtual local area networks (VLANs).

Syntax	`mac-address-table static` *`mac-address`* `output` *`interface`* `vlan` *`vlan-id`*	
	To remove a MAC address, use the `no mac-address-table static` *`mac-address`* `output` *`interface`* `vlan` *`vlan-id`* command.	
Parameters	***mac-address***	Enter the 48-bit hexadecimal address in nn:nn:nn:nn:nn:nn format.
	output ***interface***	Enter the keyword `output` then one of the following interfaces for which traffic is forwarded: • For a Port Channel interface, enter the keywords `port-channel` then a number. The range is from 1 to 128. • For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` then the slot/port information. • For a 40-Gigabit Ethernet interface, enter the keyword `fortyGigE` then the slot/port information.

	vlan *vlan-id*	Enter the keyword `vlan` then a VLAN ID number from 1 to 4094.
Defaults	Not configured.	
Command Modes	CONFIGURATION	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

mac-address-table station-move refresh-arp

Ensure that address resolution protocol (ARP) refreshes the egress interface when a station move occurs due to a topology change.

Syntax	`[no] mac-address-table station-move refresh-arp`	
Defaults	none	
Command Modes	CONFIGURATION	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.
Usage Information	For details about using this command, refer to the "NIC Teaming" section of the Layer 2 chapter in the *Dell Networking OS Configuration Guide*.	

Link Aggregation Control Protocol (LACP)

This chapter contains commands for Dell Networks's implementation of the link aggregation control protocol (LACP) for creating dynamic link aggregation groups (LAGs) — known as port-channels in the Dell Networking Operating System (OS).

NOTE: For static LAG commands, refer to the Interfaces chapter), based on the standards specified in the IEEE 802.3 Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications.

lacp long-timeout

Configure a long timeout period (30 seconds) for an LACP session.

Syntax	`lacp long-timeout` To reset the timeout period to a short timeout (1 second), use the `no lacp long-timeout` command.

Defaults	**1 second**	
Command Modes	INTERFACE (conf-if-po-number)	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.
Usage Information	This command applies to dynamic port-channel interfaces only. When applied on a static port-channel, this command has no effect.	

lacp port-priority

To influence which ports will be put in Standby mode when there is a hardware limitation that prevents all compatible ports from aggregating, configure the port priority.

Syntax	`lacp port-priority` *priority-value* To return to the default setting, use the `no lacp port-priority` *priority-value* command.	
Parameters	***priority-value***	Enter the port-priority value. The higher the value number, the lower the priority. The range is from 1 to 65535. The default is **32768**.
Defaults	**32768**	
Command Modes	INTERFACE	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

port-channel mode

Configure the LACP port channel mode.

Syntax	`port-channel` *number* `mode [active] [passive] [off]`	
Parameters	***number***	Enter the keywords `number` then a number.
	active	Enter the keyword `active` to set the mode to the active state. **NOTE:** LACP modes are defined in *Usage Information*.
	passive	Enter the keyword `passive` to set the mode to the passive state.

		NOTE: LACP modes are defined in *Usage Information*.
	off	Enter the keyword `off` to set the mode to the off state.
		NOTE: LACP modes are defined in *Usage Information*.

Defaults	**off**	
Command Modes	INTERFACE	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.
Usage Information	LACP Modes	
	Mode	**Function**
	active	An interface is in an active negotiating state in this mode. LACP runs on any link configured in the active state and also automatically initiates negotiation with other ports by initiating LACP packets.
	passive	An interface is not in an active negotiating state in this mode. LACP runs on any link configured in the passive state. Ports in a passive state respond to negotiation requests from other ports that are in active states. Ports in a passive state respond to LACP packets
	off	An interface cannot be part of a dynamic port channel in off mode. LACP does not run on a port configured in off mode.

port-channel-protocol lacp

Enable LACP on any LAN port.

Syntax	`port-channel-protocol lacp` To disable LACP on a LAN port, use the `no port-channel-protocol lacp` command.
Command Modes	INTERFACE

Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Example

```
Dell(conf)#interface TenGigabitethernet 3/15
Dell(conf-if-tengig-3/15)#no shutdown
Dell(conf-if-tengig-3/15)#port-channel-protocol lacp
Dell(conf-if-tengig-3/15-lacp)#port-channel 32 mode active
...
Dell(conf)#interface TenGigabitethernet 3/16
Dell(conf-if-tengig-3/16)#no shutdown
Dell(conf-if-tengig-3/16)#port-channel-protocol lacp
Dell(conf-if-tengig-3/16-lacp)#port-channel 32 mode active
```

Link Layer Discovery Protocol (LLDP)

Link layer discovery protocol (LLDP) advertises connectivity and management from the local station to the adjacent stations on an IEEE 802 LAN.

LLDP facilitates multi-vendor interoperability by using standard management tools to discover and make available a physical topology for network management. The Dell Networking operating software implementation of LLDP is based on IEEE standard 801.1ab.

The starting point for using LLDP is invoking LLDP with the `protocol lldp` command in either CONFIGURATION or INTERFACE mode.

The information LLDP distributes is stored by its recipients in a standard management information base (MIB). You can access the information by a network management system through a management protocol such as simple network management protocol (SNMP).

For details about implementing LLDP/LLDP-MED, refer to the Link Layer Discovery Protocol chapter of the *Dell Networking OS Configuration Guide*.

advertise dot3-tlv

Advertise dot3 TLVs (Type, Length, Value).

Syntax

`advertise dot3-tlv {max-frame-size}`

To remove advertised dot3-tlv, use the `no advertise dot3-tlv {max-frame-size}` command.

Parameters

max-frame-size	Enter the keywords `max-frame-size` to advertise the dot3 maximum frame size.

Defaults

none

Command Modes

CONFIGURATION (conf-lldp) and INTERFACE (conf-if-*interface*-lldp)

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.

	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

clear lldp counters

Clear LLDP transmitting and receiving counters for all physical interfaces or a specific physical interface.

Syntax `clear lldp counters` *interface*

Parameters

interface	Enter the following keywords and slot/port or number information: • For a 10-Gigabit Ethernet interface, enter the keyword `tenGigabitEthernet` then the slot/port information. • For a 40-Gigabit Ethernet interface, enter the keyword `fortyGigE` then the slot/port information.

Defaults none

Command Modes EXEC Privilege

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

debug lldp interface

To display timer events, neighbor additions or deletions, and other information about incoming and outgoing packets, enable LLDP debugging.

Syntax `debug lldp interface {`*interface* `| all}{events | packet {brief | detail} {tx | rx | both}}`

To disable debugging, use the `no debug lldp interface {`*interface* `| all}{events} {packet {brief | detail} {tx | rx | both}}` command.

Parameters

interface	Enter the following keywords and slot/port or number information: • For a 10-Gigabit Ethernet interface, enter the keyword `tenGigabitEthernet` then the slot/port information. • For a 40-Gigabit Ethernet interface, enter the keyword `fortyGigE` then the slot/port information.
all	(OPTIONAL) Enter the keyword `all` to display information on all interfaces.
events	(OPTIONAL) Enter the keyword `events` to display major events such as timer events.

	packet	(OPTIONAL) Enter the keyword `packet` to display information regarding packets coming in or going out.
	brief	(OPTIONAL) Enter the keyword `brief` to display brief packet information.
	detail	(OPTIONAL) Enter the keyword `detail` to display detailed packet information.
	tx	(OPTIONAL) Enter the keyword `tx` to display transmit-only packet information.
	rx	(OPTIONAL) Enter the keyword `rx` to display receive-only packet information.
	both	(OPTIONAL) Enter the keyword `both` to display both receive and transmit packet information.
Defaults	none	
Command Modes	EXEC Privilege	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

advertise management-tlv

Advertise management TLVs (Type, Length, Value).

Syntax

```
advertise management-tlv {system-capabilities | system-description | system-name}
```

To remove advertised management TLVs, use the `no advertise management-tlv {system-capabilities | system-description | system-name}` command.

Parameters

system-capabilities	Enter the keywords `system-capabilities` to advertise the system capabilities TLVs to the LLDP peer.
system-description	Enter the keywords `system-description` to advertise the system description TLVs to the LLDP peer.
system-name	Enter the keywords `system-name` to advertise the system name TLVs to the LLDP peer.

Defaults none

Command Modes CONFIGURATION (conf-lldp)

Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.
Usage Information	The command options `system-capabilities`, `system-description`, and `system-name` can be invoked individually or together, in any sequence.	

clear lldp neighbors

Clear LLDP neighbor information for all interfaces or a specific interface.

Syntax `clear lldp neighbors {interface}`

Parameters

interface	Enter the following keywords and slot/port or number information: • For a 10-Gigabit Ethernet interface, enter the keyword `tenGigabitEthernet` then the slot/port information. • For a 40-Gigabit Ethernet interface, enter the keyword `fortyGigE` then the slot/port information.

Defaults	none	
Command Modes	EXEC Privilege	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

disable

Enable or disable LLDP.

Syntax `disable`

To enable LLDP, use the `no disable` command.

Defaults	Enabled, that is `no disable`.	
Command Modes	CONFIGURATION (conf-lldp) and INTERFACE (conf-if-*interface*-lldp)	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Related Commands	debug lldp interface — debugs LLDP.

hello

Configure the rate at which the LLDP control packets are sent to its peer.

Syntax	`hello seconds` To revert to the default, use the `no hello seconds` command.	
Parameters	***seconds***	Enter the rate, in seconds, at which the control packets are sent to its peer. The rate is from 5 to 180 seconds. The default is **30 seconds**.
Defaults	**30 seconds**	
Command Modes	CONFIGURATION (conf-lldp) and INTERFACE (conf-if-*interface*-lldp)	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

multiplier

Set the number of consecutive misses before LLDP declares the interface dead.

Syntax	`multiplier integer` To return to the default, use the `no multiplier integer` command.	
Parameters	***integer***	Enter the number of consecutive misses before the LLDP declares the interface dead. The range is from 2 to 10.
Defaults	**4 x hello**	
Command Modes	CONFIGURATION (conf-lldp) and INTERFACE (conf-if-*interface*-lldp)	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Quality of Service (QoS)

The Dell Networking operating software commands for quality of service (QoS) include traffic conditioning and congestion control. QoS commands are not universally supported on all Dell Networking Products.

Per-Port QoS Commands

Per-port QoS (port-based QoS) allows you to define the QoS configuration on a per-physical-port basis.

dot1p-priority

Assign a value to the IEEE 802.1p bits on the traffic this interface receives.

Syntax

`dot1p-priority` *priority-value*

To delete the IEEE 802.1p configuration on the interface, use the `no dot1p-priority` command.

Parameters

priority-value Enter a value from 0 to 7.

dot1p	Queue Number
0	0
1	0
2	0
3	1
4	2
5	3
6	3
7	3

Defaults none

Command Modes INTERFACE

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information

The `dot1p-priority` command changes the priority of incoming traffic on the interface. The system places traffic marked with a priority in the correct queue and processes that traffic according to its queue.

When you set the priority for a port channel, the physical interfaces assigned to the port channel are configured with the same value. You cannot assign the `dot1p-priority` command to individual interfaces in a port channel.

service-class dynamic dot1p

Honor all 802.1p markings on incoming switched traffic on an interface (from INTERFACE mode) or on all interfaces (from CONFIGURATION mode). A CONFIGURATION mode entry supersedes an INTERFACE mode entry.

Syntax

`service-class dynamic dot1p`

To return to the default setting, use the `no service-class dynamic dot1p` command.

Defaults

All dot1p traffic is mapped to Queue 0 unless you enable the `service-class dynamic dot1p` command. The default mapping is as follows:

dot1p	Queue ID
0	0
1	0
2	0
3	1
4	2
5	3
6	3
7	3

Command Modes

- INTERFACE
- CONFIGURATION

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information

To honor all incoming 802.1p markings on incoming switched traffic on the interface, enter this command. By default, this facility is not enabled (that is, the 802.1p markings on incoming traffic are not honored).

You can apply this command on both physical interfaces and port channels. When you set the service-class dynamic for a port channel, the physical interfaces

assigned to the port channel are automatically configured; you cannot assign the `service-class dynamic` command to individual interfaces in a port channel.

- All dot1p traffic is mapped to Queue 0 unless you enable the `service-class dynamic dot1p` command on an interface or globally.
- Layer 2 or Layer 3 service policies supersede dot1p service classes.

service-class dot1p-mapping

Configure a service-class criterion based on a dot1p value.

Syntax

```
service-class dot1p-mapping {dot1p0 value | dot1p1 value |
dot1p2 queue | dot1p3 value | dot1p4 value| dot1p5 value |
dot1p6 value | dot1p7 value}
```

Parameters

value	Enter a dot1p list number and value. The list number range is from 0 to 7. The range is from 0 to 3.

Defaults

For each dot1p Priority, the default CoS queue value is:

- dot1p CoS Queue

  0 0-7

  1 0-7

  2 0-7

  3 0-7

  4 0-7

  5 0-7

  6 0-7

  7 0-7

Command Modes

CONFIGURATION

Command History

This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 9.0.2.0	Introduced on the S6000.

	Version 8.3.19.0	Introduced on the S4820T.
	Version 8.3.11.1	Introduced on the Z9000.
	Version 8.3.7.0	Introduced on the S4810.

Usage Information To apply dot1p-queue-mapping, use the `service-class dynamic dot1p` command.

Related Commands service-class dot1p-mapping — displays the dot1p priority to queue mapping on the switch.

service-class bandwidth-percentage

Specify a minimum bandwidth for queues.

Syntax `service-class bandwidth-percentage queue0 number queue1 number queue2 number queue3 number`

Parameters

number	Enter the bandwidth-weight, as a percentage. The range is from 1 to 100.

Defaults none

Command Modes CONFIGURATION

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information Guarantee a minimum bandwidth to different queues globally using the `service-class bandwidth-percentage` command from CONFIGURATION mode. The command is applied in the same way as the `bandwidth-percentage` command in an output QoS policy. The `bandwidth-percentage` command in QOS-POLICY-OUT mode supersedes the `service-class bandwidth-percentage` command.

When you enable ETS, the egress QoS features in the output QoS policy-map (such as `service-class bandwidth-percentage` and `bandwidth-percentage`), the default bandwidth allocation ratio for egress queues are superseded by ETS configurations. This is to provide compatibility with DCBX. Therefore, Dell Networking OS recommends disabling ETS when you wish to apply these features exclusively. After you disable ETS on an interface, the configured parameters are applied.

Policy-Based QoS Commands

Policy-based traffic classification is handled with class maps. These maps classify unicast traffic into one of four classes. The system allows you to match multiple class maps and specify multiple match criteria. Policy-based QoS is not supported on logical interfaces, such as port-channels, VLANs, or Loopbacks.

bandwidth-percentage

Assign a percentage of weight to the class/queue.

Syntax

`bandwidth-percentage` *`percentage`*

To remove the bandwidth percentage, use the `no bandwidth-percentage` command.

Parameters

percentage	Enter the percentage assignment of weight to the class/ queue. The range is from 1 to 100% (granularity 1%).

Defaults

none

Command Modes

CONFIGURATION (conf-qos-policy-out)

Command History

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information

The unit of bandwidth percentage is 1%. If the sum of the bandwidth percentages given to all eight classes exceeds 100%, the bandwidth percentage automatically scales down to 100%.

Related Commands

qos-policy-output — creates a QoS output policy.

description

Add a description to the selected policy map or QoS policy.

Syntax

`description {`*`description`*`}`

To remove the description, use the `no description {`*`description`*`}` command.

Parameters

description	Enter a description to identify the policies (80 characters maximum).

Defaults

none

Command Modes	CONFIGURATION (policy-map-input and policy-map-output; conf-qos-policy-in and conf-qos-policy-out; wred)
Command History	**Version 9.2(0.0)** Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only. **Version 8.3.16.1** Introduced on the MXL 10/40GbE Switch IO Module.
Related Commands	policy-map-output — creates an output policy map. qos-policy-output — creates an output QoS-policy on the router.

policy-aggregate

Allow an aggregate method of configuring per-port QoS via policy maps. An aggregate QoS policy is part of the policy map (input/output) applied on an interface.

Syntax	`policy-aggregate` *`qos-policy-name`* To remove a policy aggregate configuration, use the `no policy-aggregate` *`qos-policy-name`* command.
Parameters	***qos-policy-name*** Enter the name of the policy map in character format (32 characters maximum).
Defaults	none
Command Modes	CONFIGURATION (policy-map-input and policy-map-output)
Command History	**Version 9.2(0.0)** Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only. **Version 8.3.16.1** Introduced on the MXL 10/40GbE Switch IO Module.
Usage Information	If the rate shape exists in both aggregate and per-queue qos-policy, minimum of two take effect. Some of all Queue-rate will not exceed aggregate.
Related Commands	policy-map-output — creates an output policy map.

policy-map-output

Create an output policy map.

Syntax	`policy-map-output` *`policy-map-name`* To remove a policy map, use the `no policy-map-output` *`policy-map-name`* command.

Parameters	***policy-map-name***	Enter the name for the policy map in character format (32 characters maximum).
Defaults	none	
Command Modes	CONFIGURATION	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.
Usage Information	To assign traffic to different flows using QoS policy, use the Output Policy map. This command enables Policy-Map-Output Configuration mode (conf-policy-map-out).	
Related Commands	service-queue — assigns a class map and QoS policy to different queues. policy-aggregate — allows an aggregate method of configuring per-port QoS using policy maps. service-policy output — applies an output policy map to the selected interface.	

qos-policy-output

Create a QoS output policy.

Syntax	`qos-policy-output qos-policy-name` To remove an existing output QoS policy, use the `no qos-policy-output qos-policy-name` command.	
Parameters	***qos-policy-name***	Enter your output QoS policy name in character format (32 characters maximum).
Defaults	none	
Command Modes	CONFIGURATION	
Command History	**Version 8.3.16.1**	Introduced on the MXL 10/40GbE Switch IO Module.
Usage Information	To specify the name of the output QoS policy, use this command. After the output policy is specified, rate shape, scheduler strict, bandwidth-percentage, and WRED can be defined. This command enables Qos-Policy-Output Configuration mode — (conf-qos-policy-out).	

Related Commands	bandwidth-percentage — assigns weight to the class/queue percentage.

rate-shape

Shape the traffic output on the selected interface.

Syntax	`rate-shape [kbps] rate [burst-KB]`	
Parameters	**kbps**	Enter the keyword `kbps` to specify the rate limit in Kilobits per second (Kbps). Make the following value a multiple of 64. The range is from 0 to 40000000. The default granularity is Megabits per second (Mbps).
	rate	Enter the outgoing rate in multiples of 10 Mbps. The range is from 10 to 10000.
	burst-KB	(OPTIONAL) Enter the burst size in KB. The range is from 0 to 10000. The default is **50**.
Defaults	Granularity for rate is **Mbps** unless you use the `kbps` option.	
Command Modes	QOS-POLICY-OUT	
Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.
Usage Information	When you apply `rate-shape` in QoS policy both on the Queue Level and in Aggregate mode, the queue-based shaping occurs first then aggregate rate shaping.	

service-policy output

Apply an output policy map to the selected interface.

Syntax	`service-policy output policy-map-name` To remove the output policy map from the interface, use the `no service-policy output policy-map-name` command.	
Parameters	***policy-map-name***	Enter the name for the policy map in character format (16 characters maximum). You can identify an existing policy map or name one that does not yet exist.
Defaults	none	
Command Modes	INTERFACE	

Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information A single policy-map can be attached to one or more interfaces to specify the service-policy for those interfaces. A policy map attached to an interface can be modified.

Related Commands policy-map-output — creates an output policy map.

service-queue

Assign a class map and QoS policy to different queues.

Syntax `service-queue` *`queue-id`* `[class-map` *`class-map-name`*`] [qos-policy` *`qos-policy-name`*`]`

To remove the queue assignment, use the `no service-queue` *`queue-id`* `[class-map` *`class-map-name`*`] [qos-policy` *`qos-policy-name`*`]` command.

Parameters

queue-id	Enter the value used to identify a queue. The range is from 0 to 3 (four queues per interface; four queues are reserved for control traffic).
class-map ***class-map-name***	(OPTIONAL) Enter the keyword `class-map` then the class map name assigned to the queue in character format (32 character maximum).
	NOTE: This option is available under `policy-map-input` only.
qos-policy ***qos-policy-name***	(OPTIONAL) Enter the keywords `qos-policy` then the QoS policy name assigned to the queue in text format (32 characters maximum). This specifies the input QoS policy assigned to the queue under `policy-map-input` and output QoS policy under `policy-map-output` context.

Defaults none

Command Modes CONFIGURATION (conf-policy-map-in and conf-policy-map-out)

Command History	**Version 9.2(0.0)**	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.16.1	Introduced on the MXL 10/40GbE Switch IO Module.

Usage Information	There are four queues per interface on the MXL switch. This command assigns a class map or QoS policy to different queues.
Related Commands	service-policy output — applies an output policy map to the selected interface.

show qos qos-policy-output

View the output QoS policy details.

Syntax	`show qos qos-policy-output [qos-policy-name]`
Parameters	***qos-policy-name*** Enter the QoS policy name.
Defaults	none
Command Modes	• EXEC • EXEC Privilege
Command History	**Version 8.3.16.1** Introduced on the MXL 10/40GbE Switch IO Module.

Example	`Dell#show qos qos-policy-output`
	
	`Qos-policy-output qmap_out`
	`Bandwidth-percentage 10`
	`Qos-policy-output qmap_wg`
	`Rate-shape 100 50`
	`Wred yellow wy`
	`Wred green wg`
	`Dell#`

Simple Network Management Protocol (SNMP) and Syslog

This chapter contains commands to configure and monitor the simple network management protocol (SNMP) v1/v2/v3 and Syslog.

The chapter contains the following sections:

- SNMP Commands
- Syslog Commands

SNMP Commands

The following SNMP commands are available in the Dell Networking operating software.

The simple network management protocol (SNMP) is used to communicate management information between the network management stations and the agents in the network elements. Dell Networking OS supports SNMP versions 1, 2c, and 3, supporting both read-only and read-write modes. Dell Networking

OS sends SNMP traps, which are messages informing an SNMP management system about the network. Dell Networking OS supports up to 16 SNMP trap receivers.

Important Points to Remember

- Typically, 5-second timeout and 3-second retry values on an SNMP server are sufficient for both LAN and WAN applications. If you experience a timeout with these values, the recommended best practice on Dell Networking switches (to accommodate their high port density) is to increase the timeout and retry values on your SNMP server to the following:
  - SNMP Timeout — greater than 3 seconds.
  - SNMP Retry count — greater than 2 seconds.
- If you want to query an E-Series switch using SNMP v1/v2/v3 with an IPv6 address, configure the IPv6 address on a non-management port on the switch.
- If you want to send SNMP v1/v2/v3 traps from an E-Series using an IPv6 address, use a non-management port.
- SNMP v3 informs are not currently supported with IPv6 addresses.
- If you are using access control lists (ACLs) in an SNMP v3 configuration, group ACL overrides user ACL if the user is part of that group.
- SNMP operations are not supported on a virtual local area network (VLAN).

snmp-server enable traps

Enable SNMP traps.

Syntax

`snmp-server enable traps [notification-type] [notification-option]`

To disable traps, use the `no snmp-server enable traps [notification-type] [notification-option]` command.

Parameters

notification-type

Enter the type of notification from the following list:

- `snmp` — Notification of RFC 1157 traps.
- `stack` — Notification of stacking traps.

notification-option

For the `envmon` notification-type, enter one of the following optional parameters:

- `cam-utilization`
- `fan`
- `supply`
- `temperature`

For the `snmp` notification-type, enter one of the following optional parameters:

- `authentication`
- `coldstart`
- `linkdown`
- `linkup`

Defaults	Not enabled.
Command Modes	CONFIGURATION
Command History	This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 9.1(0.0)	Added support for copy-config and ecmp traps.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.11.1	Introduced on the Z9000.
Version 8.3.7.0	Introduced on the S4810.
Version 8.4.1.0	Added support for VRRP traps.
Version 7.6.1.0	Added support for STP and xSTP traps. Introduced on the S-Series.
Version 7.5.1.0	Introduced on the C-Series.
E-Series legacy command	

Usage Information

Dell Networking OS supports up to 16 SNMP trap receivers.

If you do not configure this command, no traps controlled by this command are sent. If you do not specify a `notification-type` and `notification-option`, all traps are enabled.

snmp-server host

Configure the recipient of an SNMP trap operation.

Syntax

`snmp-server host` *`ip-address`* | *`ipv6-address`* `traps | informs [version 1| 2c|3] [auth |no auth | priv]` *`[community-string]`*

To remove the SNMP host, use the `no snmp-server host` *`ip-address`*| *`ipv6-address`* `traps | informs [version 1| 2c|3] [auth |no auth | priv]` *`[community-string]`* command.

Parameters

ip-address	Enter the keyword `host` then the IP address of the host (configurable hosts is limited to 16).
ipv6-address	Enter the keyword host then the IPv6 address of the host in the x:x:x:x::x format.

NOTE: The :: notation specifies successive hexadecimal fields of zero.

traps	(OPTIONAL) Enter the keyword `traps` to send trap notifications to the specified host. The default is **traps**.
informs	(OPTIONAL) Enter the keyword `informs` to send inform notifications to the specified host. The default is **traps**.
version 1 | 2c | 3	(OPTIONAL) Enter the keyword version to specify the security model then the security model version number `1`, `2c`, or `3`: • Version `1` is the least secure version. • Version `3` is the most secure of the security modes. • Version `2c` allows transmission of informs and counter 64, which allows for integers twice the width of what is normally allowed. The default is version **1**.
auth	(OPTIONAL) Enter the keyword `auth` to specify authentication of a packet without encryption.
noauth	(OPTIONAL) Enter the keyword `noauth` to specify no authentication of a packet.
priv	(OPTIONAL) Enter the keyword `priv` to specify both authentication and then scrambling of the packet.
community-string	Enter a text string (up to 20 characters long) as the name of the SNMP community. NOTE: For version 1 and version 2c security models, this string represents the name of the SNMP community. The string can be set using this command; however, Dell Networking OS recommends setting the community string using the `snmp-server community` command before executing this command. For version 3 security model, this string is the USM user security name.

Defaults As above.

Command Modes CONFIGURATION

Command History This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.

Version 9.1(0.0)	Added support for config and ecmp traps.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.11.1	Introduced on the Z9000.
Version 8.3.7.0	Introduced on the S4810.
Version 8.4.1.0	Added support for VRRP traps.
Version 7.6.1.0	Added support for STP and xSTP notification types. Introduced on the S-Series.
Version 7.5.1.0	Introduced on the C-Series.
E-Series legacy command	

Usage Information

In order to configure the router to send SNMP notifications, enter at least `one snmp-server host` command. If you enter the command with no keywords, all trap types are enabled for the host. If you do not enter an `snmp-server host` command, no notifications are sent.

In order to enable multiple hosts, issue a separate `snmp-server host` command for each host. You can specify multiple notification types in the command for each host.

When multiple `snmp-server host` commands are given for the same host and type of notification (trap or inform), each succeeding command overwrites the previous command. Only the last `snmp-server host` command will be in effect. For example, if you enter an `snmp-server host inform` command for a host and then enter another `snmp-server host inform` command for the same host, the second command replaces the first command.

The `snmp-server host` command is used with the `snmp-server enable` command. Use the `snmp-server enable` command to specify which SNMP notifications are sent globally. For a host to receive most notifications, at least one `snmp-server enable` command and the `snmp-server host` command for that host must be enabled.

NOTE: For v1 / v2c trap configuration, if the community-string is not defined using the `snmp-server community` command prior to using this command, the default form of the `snmp-server community` command automatically is configured with the community-name the same as specified in the `snmp-server host` command.

Configuring Informs

To send an inform, use the following steps:

1. Configure a remote engine ID.
2. Configure a remote user.
3. Configure a group for this user with access rights.

4. Enable traps.
5. Configure a host to receive informs.

Related Commands	snmp-server enable traps — enables SNMP traps.

Syslog Commands

The following commands allow you to configure logging functions on all Dell Networking switches.

clear logging

Clear the messages in the logging buffer.

Syntax	`clear logging`
Defaults	none
Command Modes	EXEC Privilege
Command History	This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*. The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.11.1	Introduced on the Z9000.
Version 8.3.7.0	Introduced on the S4810.
Version 7.6.1.0	Introduced on the S-Series.
Version 7.5.1.0	Introduced on the C-Series.
E-Series legacy command	

Related Commands	show logging — displays logging settings and system messages in the internal buffer.

logging

Configure an IP address or host name of a Syslog server where logging messages are sent. Multiple logging servers of both IPv4 and/or IPv6 can be configured.

Syntax	`logging {`*`ip-address`* `|` *`ipv6-address`* `|` *`hostname`*`} [vrf` *`vrf-name`*`]` To disable logging, use the `no logging` command.

Parameters	*ip-address*	Enter the IPv4 address in dotted decimal format.
	ipv6-address	Enter the IPv6 address in the x:x:x:x::X format. **NOTE:** The :: notation specifies successive hexadecimal fields of zeros.
	hostname	Enter the name of a host already configured and recognized by the switch.
Defaults	Disabled.	
Command Modes	CONFIGURATION	
Command History	This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*. The following is a list of the Dell Networking OS version history for this command.	
	Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
	Version 8.3.19.0	Introduced on the S4820T.
	Version 8.3.11.1	Introduced on the Z9000.
	Version 8.3.7.0	Introduced on the S4810.
	Version 8.4.1.0	Added support for IPv6.
	Version 7.6.1.0	Introduced on the S-Series.
	Version 7.5.1.0	Introduced on the C-Series.
	E-Series legacy command	
Usage Information	Multiple logging servers of both IPv4 and/or IPv6 can be configured.	
Related Commands	logging trap — enables logging to the Syslog server based on severity.	

logging buffered

Enable logging and specify which messages are logged to an internal buffer. By default, all messages are logged to the internal buffer.

Syntax	`logging buffered [level] [size]` To return to the default values, use the `default logging buffered` command. To disable logging stored to an internal buffer, use the `no logging buffered` command.

Parameters

level	(OPTIONAL) Indicate a value from 0 to 7 or enter one of the following equivalent words: `emergencies`, `alerts`, `critical`, `errors`, `warnings`, `notifications`, `informational`, or `debugging`. The default is **7** or **debugging**.
size	(OPTIONAL) Indicate the size, in bytes, of the logging buffer. The number of messages buffered depends on the size of each message. The range is from 40960 to 524288. The default is **40960 bytes**.

Defaults level = **7**; size = **40960 bytes**

Command Modes CONFIGURATION

Command History This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 9.0.2.0	Introduced on the S6000.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.11.1	Introduced on the Z9000.
Version 8.3.7.0	Introduced on the S4810.
Version 7.6.1.0	Introduced on the S-Series.
Version 7.5.1.0	Introduced on the C-Series.
E-Series legacy command	

Usage Information When you decrease the buffer size, all messages stored in the buffer are lost. Increasing the buffer size does not affect messages stored in the buffer.

Related Commands clear logging — clears the logging buffer.

show logging — displays the logging setting and system messages in the internal buffer.

logging console

Specify which messages are logged to the console.

Syntax `logging console [level]`

To return to the default values, use the `default logging console` command.

To disable logging to the console, use the `no logging console` command.

Parameters

level	(OPTIONAL) Indicate a value from 0 to 7 or enter one of the following parameters: `emergencies`, `alerts`, `critical`, `errors`, `warnings`, `notifications`, `informational`, or `debugging`. The default is **7** or **debugging**.

Defaults level = **7**; size = **debugging**

Command Modes CONFIGURATION

Command History This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.11.1	Introduced on the Z9000.
Version 8.3.7.0	Introduced on the S4810.
Version 7.6.1.0	Introduced on the S-Series.
Version 7.5.1.0	Introduced on the C-Series.
E-Series legacy command	

Related Commands clear logging — clears the logging buffer.

show logging — displays the logging setting and system messages in the internal buffer.

logging monitor

Specify which messages are logged to Telnet applications.

Syntax `logging monitor [level]`

To disable logging to terminal connections, use the `no logging monitor` command.

Parameters

level	Indicate a value from 0 to 7 or enter one of the following parameters: `emergencies`, `alerts`, `critical`, `errors`, `warnings`, `notifications`, `informational`, or `debugging`. The default is **7** or **debugging**.

Defaults	**7** or **debugging**
Command Modes	CONFIGURATION
Command History	This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 9.0.2.0	Introduced on the S6000.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.11.1	Introduced on the Z9000.
Version 8.3.7.0	Introduced on the S4810.
Version 7.6.1.0	Introduced on the S-Series.
Version 7.5.1.0	Introduced on the C-Series.

logging source-interface

Specify that the IP address of an interface is the source IP address of Syslog packets sent to the Syslog server.

Syntax `logging source-interface` *interface*

To disable this command and return to the default setting, use the `no logging source-interface` command.

Parameters

interface Enter the following keywords and slot/port or number information:

- For a 100/1000 Ethernet interface, enter the keyword `GigabitEthernet` then the slot/port information.
- For Loopback interfaces, enter the keyword `loopback` then a number from zero (0) to 16383.
- For the management interface on the RPM, enter the keyword `ManagementEthernet` then the slot/port information. The slot range is from 0 to 1 and the port range is 0.
- For a Port Channel interface, enter the keywords `port-channel` then a number. Tthe range is from 1 to 128.
- For a ten-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` then the slot/port information.
- For a 40-Gigabit Ethernet interface, enter the keyword `fortyGigE` then the slot/port information.
- For VLAN interface, enter the keyword `vlan` then a number from 1 to 4094.

Defaults	Not configured.
Command Modes	CONFIGURATION
Command History	This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 9.0.2.0	Introduced on the S6000.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.11.1	Introduced on the Z9000.
Version 8.3.7.0	Introduced on the S4810.
Version 8.5.1.0	Added support for 4-port 40G line cards on ExaScale.
Version 7.6.1.0	Introduced on the S-Series.
Version 7.5.1.0	Introduced on the C-Series.
E-Series legacy command	

Usage Information	Syslog messages contain the IP address of the interface used to egress the router. By configuring the `logging source-interface` command, the Syslog packets contain the IP address of the interface configured.
Related Commands	logging— enables logging to the Syslog server.

show logging

Display the logging settings and system messages logged to the internal buffer of the switch.

Syntax

```
show logging [number | history [reverse][number] | reverse [number] | summary]
```

Parameters

number	(OPTIONAL) Enter the number of messages displayed in the output. The range is from 1 to 65535.
history	(OPTIONAL) Enter the keyword `history` to view only information in the Syslog history table.
reverse	(OPTIONAL) Enter the keyword `reverse` to view the Syslog messages in FIFO (first in, first out) order.
summary	(OPTIONAL) Enter the keyword `summary` to view a table showing the number of messages per type and per slot. Slots *7* and *8* represent RPMs.

Command Modes

- EXEC
- EXEC Privilege

Command History

This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 9.0.2.0	Introduced on the S6000.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.11.1	Introduced on the Z9000.
Version 8.3.7.0	Introduced on the S4810.
Version 7.6.1.0	Introduced on the S-Series.
Version 7.5.1.0	Introduced on the C-Series.
E-Series legacy command	

Example (Partial)

```
Dell#show logging
Syslog logging: enabled
    Console logging: level debugging
    Monitor logging: level debugging
    Buffer logging: level debugging, 5604 Messages Logged,
Size (524288 bytes)
    Trap logging: level informational
Oct 8 09:25:37: %RPM1:RP1 %BGP-5-ADJCHANGE: Connection with
neighbor 223.80.255.254 closed. Hold time
expired
Oct 8 09:25:38: %RPM1:RP1 %BGP-5-ADJCHANGE: Neighbor
192.200.13.2 Up
Oct 8 09:25:38: %RPM1:RP1 %BGP-5-ADJCHANGE: Neighbor
192.1.1.13 Up
Oct 8 09:25:38: %RPM1:RP1 %BGP-5-ADJCHANGE: Neighbor 1.1.14.2
Up
Oct 8 09:25:38: %RPM1:RP1 %BGP-5-ADJCHANGE: Neighbor
192.1.1.14 Up
Oct 8 09:25:38: %RPM1:RP1 %BGP-5-ADJCHANGE: Neighbor 1.1.11.2
Up
Oct 8 09:25:38: %RPM1:RP1 %BGP-5-ADJCHANGE: Neighbor 192.1.1.5
Up
Oct 8 09:25:38: %RPM1:RP1 %BGP-5-ADJCHANGE: Neighbor 192.4.1.3
Up
Oct 8 09:25:38: %RPM1:RP1 %BGP-5-ADJCHANGE: Neighbor 192.1.1.4
Up
Oct 8 09:25:38: %RPM1:RP1 %BGP-5-ADJCHANGE: Neighbor 192.1.1.6
Up
Oct 8 09:25:38: %RPM1:RP1 %BGP-5-ADJCHANGE: Neighbor
192.1.1.12 Up
Oct 8 09:25:38: %RPM1:RP1 %BGP-5-ADJCHANGE: Neighbor
192.1.1.15 Up
Oct 8 09:25:38: %RPM1:RP1 %BGP-5-ADJCHANGE: Neighbor 192.1.1.3
```

```
Up
Oct 8 09:25:38: %RPM1:RP1 %BGP-5-ADJCHANGE: Neighbor
192.200.12.2 Up
Oct 8 09:25:38: %RPM1:RP1 %BGP-5-ADJCHANGE: Neighbor 1.1.10.2
Up
Oct 8 09:25:38: %RPM1:RP1 %BGP-5-ADJCHANGE: Session closed by
neighbor 1.1.10.2 (Hold time expired)
Oct 8 09:25:38: %RPM1:RP1 %BGP-5-ADJCHANGE: Neighbor
192.200.14.7 Up
Oct 8 09:26:25: %RPM1:RP1 %BGP-5-ADJCHANGE: Connection with
neighbor 1.1.11.2 closed. Neighbor recycled
Oct 8 09:26:25: %RPM1:RP1 %BGP-5-ADJCHANGE: Connection with
neighbor 1.1.14.2 closed. Neighbor recycled
--More--
```

Example (History)

```
Dell#show logging history
Syslog History Table: 1 maximum table entries,
saving level Warnings or higher
  SNMP notifications not Enabled
%RPM:0:0 %CHMGR-2-LINECARDDOWN - Line card 3 down - IPC timeout
Dell#
```

show logging driverlog stack-unit

Display the driver log for the specified stack member.

Syntax `show logging driverlog stack-unit unit#`

Parameters

stack-unit *unit#*	Enter the keywords `stack-unit` followed by the stack member ID of the switch for which you want to display the driver log. The range is from 0 to 7.

defaults none

Command Modes

- EXEC
- EXEC Privilege

Command History This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 9.0.2.0	Introduced on the S6000.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.11.1	Introduced on the Z9000.
Version 8.3.7.0	Introduced on the S4810.
Version 7.6.1.0	Introduced on the S-Series.

Usage Information	This command displays internal software driver information, which may be useful during troubleshooting switch initialization errors, such as a downed Port-Pipe.

terminal monitor

Configure the Dell Networking OS to display messages on the monitor/terminal.

Syntax	`terminal monitor` To return to default settings, use the `terminal no monitor` command.
defaults	Disabled.
Command Modes	• EXEC • EXEC Privilege
Command History	This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*. The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 9.0.2.0	Introduced on the S6000.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.11.1	Introduced on the Z9000.
Version 8.3.7.0	Introduced on the S4810.
Version 7.6.1.0	Introduced on the S-Series.
Version 7.5.1.0	Introduced on the C-Series.
E-Series legacy command	

Related Commands	logging monitor— sets the logging parameters on the monitor/terminal.

Storm Control

The Dell Networking operating software storm control feature allows you to limit or suppress traffic during a traffic storm.

Important Points to Remember

- Interface commands can only be applied on physical interfaces (virtual local area networks [VLANs] and link aggregation group [LAG] interfaces are not supported).

- An INTERFACE-level command only supports storm control configuration on ingress.
- An INTERFACE-level command overrides any CONFIGURATION-level ingress command for that physical interface, if both are configured.
- You can apply the CONFIGURATION-level storm control commands at ingress or egress and are supported on all physical interfaces.
- When storm control is applied on an interface, the percentage of storm control applied is calculated based on the advertised rate of the line card. It is not based on the speed setting for the line card.
- Do not apply per-VLAN quality of service (QoS) on an interface that has storm control enabled (either on an interface or globally).
- When you enable broadcast storm control on an interface or globally on ingress, and DSCP marking for a DSCP value 1 is configured for the data traffic, the traffic goes to queue 1 instead of queue 0.
- Similarly, if you enable unicast storm control on an interface or globally on ingress, and DSCP marking for a DSCP value 2 is configured for the data traffic, the traffic goes to queue 2 instead of queue 0.

NOTE: Bi-directional traffic (unknown unicast and broadcast) along with egress storm control causes the configured traffic rates split between the involved ports. The percentage of traffic that each port receives after the split is not predictable. These ports can be in the same/different port pipes or the same/different line cards.

NOTE: The policy discard drop counters are common across storm-control drops, ACL drops and QoS drops. Therefore, if your configuration includes ACL and QoS, those drops are also computed and displayed in the policy discard drops counter field along with storm-control drops. The packets dropped by the storm control feature can be monitored by viewing the value of the Policy Discard Drops field of the output of the `show hardware stack-unit 0 drops` command.

show storm-control unknown-unicast

Display the storm control unknown-unicast configuration.

Syntax

```
show storm-control unknown-unicast [interface]
```

Parameters

interface — (OPTIONAL) Enter one of the following interfaces to display the interface specific storm control configuration:

- For a 1-Gigabit Ethernet interface, enter the keyword `GigabitEthernet` then y the slot/port information.
- For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` then the slot/port information.
- For a 40-Gigabit Ethernet interface, enter the keyword `fortyGigE` then the slot/ port information.

Defaults

none

Command Modes

- EXEC
- EXEC Privilege

Command History

This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.11.1	Introduced on the Z9000.
Version 8.5.1.0	Added support for 4-port 40G line cards on ExaScale.
Version 8.3.7.0	Introduced on the S4810.
Version 7.6.1.0	Introduced on the S-Series.
Version 7.5.1.0	Introduced on the C-Series.
Version 6.5.1.0	Introduced on the E-Series.

Uplink Failure Detection (UFD)

Uplink failure detection (UFD) provides detection of the loss of upstream connectivity and, if you use this with network interface controller (NIC) teaming, automatic recovery from a failed link.

NOTE: In Standalone, VLT, and Stacking modes, the UFD group number is 1 by default and cannot be changed.

debug uplink-state-group

Enable debug messages for events related to a specified uplink-state group or all groups.

Syntax

`debug uplink-state-group [group-id]`

To turn off debugging event messages, enter the `no debug uplink-state-group [group-id]` command.

Parameters

group-id	Enables debugging on the specified uplink-state group. The valid group-id values are from 1 to 16.

Defaults none

Command Modes EXEC Privilege

Command History This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.

Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.12.0	Introduced on the S4810.
Version 8.4.2.3	Introduced on the S-Series S50.

description

Enter a text description of an uplink-state group.

Syntax

```
description text
```

Parameters

text	Text description of the uplink-state group. The maximum length is 80 alphanumeric characters.

Defaults

none

Command Modes

UPLINK-STATE-GROUP

Command History

This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.12.0	Introduced on the S4810.
Version 8.4.2.3	Introduced on the S-Series S50.

Example

```
Dell(conf-uplink-state-group-16)# description test
Dell(conf-uplink-state-group-16)#
```

Related Commands

uplink-state-group— creates an uplink-state group and enables the tracking of upstream links.

downstream

Assign a port or port-channel to the uplink-state group as a downstream interface.

Syntax

```
downstream interface
```

To delete an uplink-state group, enter the `no downstream interface` command.

Parameters

interface Enter one of the following interface types:

- Fast Ethernet: `fastethernet {slot/port | slot/port-range}`
- 1 Gigabit Ethernet: `gigabitethernet {slot/port | slot/port-range}`
- 10 Gigabit Ethernet: `tengigabitethernet {slot/port |slot/port-range}`
- Port channel: `port-channel {1-512 | port-channel-range}`

Where `port-range` and `port-channel-range` specify a range of ports separated by a dash (-) and/or individual ports/port channels in any order; for example: `gigabitethernet 1/1-2,5,9,11-12 port-channel 1-3,5`. A comma is required to separate each port and port-range entry.

Defaults none

Command Modes UPLINK-STATE-GROUP

Command History This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.12.0	Introduced on the S4810.
Version 8.4.2.3	Introduced on the S-Series S50.

Usage Information You can assign physical port or port-channel interfaces to an uplink-state group.

You can assign an interface to only one uplink-state group. Configure each interface assigned to an uplink-state group as either an upstream or downstream interface, but not both.

You can assign individual member ports of a port channel to the group. An uplink-state group can contain either the member ports of a port channel or the port channel itself, but not both.

Related Commands	• upstream— assigns a port or port-channel to the uplink-state group as an upstream interface. • uplink-state-group — creates an uplink-state group and enables the tracking of upstream links.

downstream auto-recover

Enable auto-recovery so that UFD-disabled downstream ports in an uplink-state group automatically come up when a disabled upstream port in the group comes back up.

Syntax	`downstream auto-recover` To disable auto-recovery on downstream links, use the `no downstream auto-recover` command.
Defaults	The auto-recovery of UFD-disabled downstream ports is enabled.
Command Modes	UPLINK-STATE-GROUP
Command History	This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*. The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.12.0	Introduced on the S4810.
Version 8.4.2.3	Introduced on the S-Series S50.

Related Commands	• downstream— assigns a port or port-channel to the uplink-state group as a downstream interface. • uplink-state-group — creates an uplink-state group and enables the tracking of upstream links.

downstream disable links

Configure the number of downstream links in the uplink-state group that are disabled if one upstream link in an uplink-state group goes down.

Syntax	`downstream disable links {`*`number`*` |all}` To revert to the default setting, use the `no downstream disable links` command.

Parameters

number	Enter the number of downstream links to be brought down by UFD. The range is from 1 to 1024.
all	Brings down all downstream links in the group.

Defaults No downstream links are disabled when an upstream link in an uplink-state group goes down.

Command Modes UPLINK-STATE-GROUP

Command History This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.12.0	Introduced on the S4810.
Version 8.4.2.3	Introduced on the S-Series S50.

Usage Information A user-configurable number of downstream interfaces in an uplink-state group are put into a link-down state with an UFD-Disabled error message when one upstream interface in an uplink-state group goes down.

If all upstream interfaces in an uplink-state group go down, all downstream interfaces in the same uplink-state group are put into a link-down state.

Related Commands

- downstream — assigns a port or port-channel to the uplink-state group as a downstream interface.
- uplink-state-group — creates an uplink-state group and enables the tracking of upstream links.

enable

Enable uplink state group tracking for a specific UFD group.

Syntax `enable`

To disable upstream-link tracking without deleting the uplink-state group, use the `no enable` command.

Defaults Upstream-link tracking is automatically enabled in an uplink-state group.

Command Modes	UPLINK-STATE-GROUP
Command History	This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*. The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.19.0	Introduced on the S4820T
Version 8.3.12.0	Introduced on the S4810.
Version 8.4.2.3	Introduced on the S-Series S50.

Related Commands

- uplink-state-group— creates an uplink-state group and enables the tracking of upstream links.

show running-config uplink-state-group

Display the current configuration of one or more uplink-state groups.

Syntax `show running-config uplink-state-group [group-id]`

Parameters

group-id	Displays the current configuration of all uplink-state groups or a specified group. The valid group-id values are from 1 to 16.

Defaults none

Command Modes

- EXEC
- EXEC Privilege

Command History This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.12.0	Introduced on the S4810.

	Version 8.4.2.3	Introduced on the S-Series S50.

Example

```
Dell#show running-config uplink-state-group
!
no enable
uplink state track 1
downstream GigabitEthernet 0/2,4,6,11-19
upstream TengigabitEthernet 0/48, 52
upstream PortChannel 1
!
uplink state track 2
downstream GigabitEthernet 0/1,3,5,7-10
upstream TengigabitEthernet 0/56,60
```

Related Commands

- show uplink-state-group — displays the status information on a specified uplink-state group or all groups.
- uplink-state-group — creates an uplink-state group and enables the tracking of upstream links.

show uplink-state-group

Display status information on a specified uplink-state group or all groups.

Syntax

```
show uplink-state-group [group-id] [detail]
```

Parameters

group-id	Displays status information on a specified uplink-state group or all groups. The valid group-id values are from 1 to 16.
detail	Displays additional status information on the upstream and downstream interfaces in each group

Defaults none

Command Modes

- EXEC
- EXEC Privilege

Command History

This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.12.0	Introduced on the S4810.
Version 8.4.2.3	Introduced on the S-Series S50.

Example

```
Dell# show uplink-state-group
Uplink State Group: 1 Status: Enabled, Up
Uplink State Group: 3 Status: Enabled, Up
Uplink State Group: 5 Status: Enabled, Down
Uplink State Group: 6 Status: Enabled, Up
Uplink State Group: 7 Status: Enabled, Up
Uplink State Group: 16 Status: Disabled, Up

Dell# show uplink-state-group 16
Uplink State Group: 16 Status: Disabled, Up

Dell#show uplink-state-group detail
(Up): Interface up (Dwn): Interface down (Dis): Interface
disabled
Uplink State Group    : 1 Status: Enabled, Up
Upstream Interfaces   :
Downstream Interfaces :

Uplink State Group    : 3 Status: Enabled, Up
Upstream Interfaces   : Gi 0/46(Up) Gi 0/47(Up)
Downstream Interfaces : Te 13/0(Up) Te 13/1(Up) Te 13/3(Up) Te
13/5(Up) Te 13/6(Up)

Uplink State Group    : 5 Status: Enabled, Down
Upstream Interfaces   : Gi 0/0(Dwn) Gi 0/3(Dwn) Gi 0/5(Dwn)
Downstream Interfaces : Te 13/2(Dis) Te 13/4(Dis) Te
13/11(Dis) Te 13/12(Dis) Te 13/13(Dis) Te 13/14(Dis) Te
13/15(Dis)

Uplink State Group    : 6 Status: Enabled, Up
Upstream Interfaces   :
Downstream Interfaces :

Uplink State Group    : 7 Status: Enabled, Up
Upstream Interfaces   :
Downstream Interfaces :

Uplink State Group    : 16 Status: Disabled, Up
Upstream Interfaces   : Gi 0/41(Dwn) Po 8(Dwn)
Downstream Interfaces : Gi 0/40(Dwn)
```

Related Commands

- show running-config uplink-state-group— displays the current configuration of one or more uplink-state groups.
- uplink-state-group — create an uplink-state group and enables the tracking of upstream links.

uplink-state-group

Create an uplink-state group and enable the tracking of upstream links on a switch/ router.

Syntax

`uplink-state-group` *`group-id`*

To delete an uplink-state group, enter the `no uplink-state-group group-id` command.

Parameters

group-id	Enter the ID number of an uplink-state group. The range is from 1 to 16.

Defaults	none
Command Modes	CONFIGURATION
Command History	This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.12.0	Introduced on the S4810.
Version 8.4.2.3	Introduced on the S-Series S50.

Usage Information

After you enter the command, to assign upstream and downstream interfaces to the group, enter Uplink-State-Group Configuration mode.

An uplink-state group is considered to be operationally up if at least one upstream interface in the group is in the Link-Up state.

An uplink-state group is considered to be operationally down if no upstream interfaces in the group are in the Link-Up state. No uplink-state tracking is performed when a group is disabled or in an operationally down state.

To disable upstream-link tracking without deleting the uplink-state group, use the `no enable` command in uplink-state-group configuration mode.

Example

```
Dell(conf)#uplink-state-group 16
Dell(conf)#
02:23:17: %RPM0-P:CP %IFMGR-5-ASTATE_UP: Changed uplink state
group Admin state to up: Group 16
```

Related Commands

- show running-config uplink-state-group — displays the current configuration of one or more uplink-state groups.
- show uplink-state-group — displays the status information on a specified uplink-state group or all groups.

upstream

Assign a port or port-channel to the uplink-state group as an upstream interface.

Syntax `upstream` *interface*

To delete an uplink-state group, use the `no upstream interface` command.

Parameters

interface — Enter one of the following interface types:

- Fast Ethernet: `fastethernet {slot/port | slot/port-range}`
- 1 Gigabit Ethernet: `gigabitethernet {slot/port | slot/port-range}`
- 10 Gigabit Ethernet: `tengigabitethernet {slot/port | slot/port-range}`
- 40 Gigabit Ethernet: `fortyGigE {slot/port | slot/port-range}`
- Port channel: `port-channel {1-512 | port-channel-range}`

Where `port-range` and `port-channel-range` specify a range of ports separated by a dash (-) and/or individual ports/port channels in any order; for example: `gigabitethernet 1/1-2,5,9,11-12 port-channel 1-3,5`. A comma is required to separate each port and port-range entry.

Defaults

none

Command Modes

UPLINK-STATE-GROUP

Command History

This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.12.0	Introduced on the S4810.
Version 8.4.2.3	Introduced on the S-Series S50.

Usage Information

You can assign physical port or port-channel interfaces to an uplink-state group.

You can assign an interface to only one uplink-state group. Configure each interface assigned to an uplink-state group as either an upstream or downstream interface, but not both.

You can assign individual member ports of a port channel to the group. An uplink-state group can contain either the member ports of a port channel or the port channel itself, but not both.

Example

```
Dell(conf-uplink-state-group-16)# upstream gigabitethernet
1/10-15
Dell(conf-uplink-state-group-16)#
```

Related Commands

- downstream — assigns a port or port-channel to the uplink-state group as a downstream interface.
- uplink-state-group — creates an uplink-state group and enables the tracking of upstream links.

Virtual Link Trunking (VLT)

VLT allows physical links between two chassis to appear as a single virtual link to the network core. VLT eliminates the requirement for Spanning Tree protocols by allowing link aggregation group (LAG) terminations on two separate distribution or core switches, and by supporting a loop-free topology. VLT provides Layer 2 multipathing, creating redundancy through increased bandwidth and enabling multiple parallel paths between nodes and load-balancing traffic where alternative paths exist.

NOTE: When you launch the VLT link, the VLT peer-ship is not established if any of the following is **TRUE**:

- The VLT System-MAC configured on both the VLT peers do not match.
- The VLT Unit-Id configured on both the VLT peers are identical.
- The VLT System-MAC or Unit-Id is configured only on one of the VLT peers.
- The VLT domain ID is not the same on both peers.

If the VLT peer-ship is already established, changing the System-MAC or Unit-Id does not cause VLT peer-ship to go down.

Also, if the VLT peer-ship is already established and the VLT Unit-Id or System-MAC are configured on both peers, then changing the CLI configurations on the VLT Unit-Id or System-MAC is rejected if any of the following become **TRUE**:

- After making the CLI configuration change, the VLT Unit-Id becomes identical on both peers.
- After making the CLI configuration change, the VLT System-MAC do not match on both peers.

When the VLT peer-ship is already established, you can remove the VLT Unit-Id or System-MAC configuration from either or both peers. However, removing configuration settings can cause the VLT ports to go down if you configure the Unit-Id or System-MAC on only one of the VLT peers.

back-up destination

Configure the IPv4 or IPv6 address of the management interface on the remote VLT peer to be used as the endpoint of the VLT backup link for sending out-of-band hello messages.

Syntax

```
back-up destination {[ipv4-address] | [ipv6 ipv6-address]
[interval seconds]}
```

Parameters

ipv4–address	Enter the IPv4 address of the backup destination.

	ipv6	Enter the keyword `ipv6` then an IPv6 address in the X:X:X:X::X format.
	interval *seconds*	Enter the keyword `interval` to specify the time interval to send hello messages. The range is from 1 to 5 seconds. The default is 1 second.

Defaults **1 second**

Command Modes VLT DOMAIN

Command History This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 9.2(0.2)	Added support for IPv6.
Version 9.0.2.0	Introduced on the S6000.
Version 9.0.0.0	Introduced on the Z9000.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.8.0	Introduced on the S4810.

clear vlt statistics

Clear the statistics on VLT operations.

Syntax
```
clear vlt statistics [arp | domain | igmp-snoop | mac |
multicast | ndp]
```

Parameters

domain	Clear the VLT statistics for the domain.
multicast	Clear the VLT statistics for multicast.
mac	Clear the VLT statistics for the MAC address.
arp	Clear the VLT statistics for ARP.
igmp-snoop	Clear the VLT statistics for IGMP snooping.
ndp	Clear the VLT statistics for NDP.

Command Modes EXEC

Command History This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 9.2(0.2)	Added `multicast` and `ndp` parameters.
Version 9.0.2.0	Introduced on the S6000.
Version 9.0.0.0	Introduced on the Z9000.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.12.0	Introduced on the S4810.

Example

```
VLT ARP Statistics
----------------
ARP Tunnel Pkts sent:0
ARP Tunnel Pkts Rcvd:0
ARP-sync Pkts Sent:0
ARP-sync Pkts Rcvd:0
ARP Reg Request sent:19
ARP Reg Request rcvd:10
```

lacp ungroup member-independent

Prevent possible loop during the bootup of a VLT peer switch or a device that accesses the VLT domain.

Syntax `lacp ungroup member-independent {vlt | port-channel}`

Parameters

port-channel	Force all LACP port-channel members to become switchports.
vlt	Force all VLT LACP members to become switchports.

Defaults Not configured.

Command Modes CONFIGURATION

Command History This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 9.0.2.0	Introduced on the S6000.
Version 9.0.0.0	Introduced on the Z9000.
Version 8.3.19.0	Introduced on the S4820T.

Version 8.3.12.0	Added port-channel parameter on the S4810.
Version 8.3.8.0	Introduced on the S4810.

Usage Information

LACP on the VLT ports (on a VLT switch or access device), which are members of the virtual link trunk, is not brought up until the VLT domain is recognized on the access device.

On the S4810, during boot-up in a stacking configuration, the system must be able to reach the DHCP server with the boot image and configuration image. During boot-up, only untagged DHCP requests are sent to the DHCP server to receive an offer on static LAGs between switches. The DHCP server must be configured to start in BMP mode. If switches are connected using LACP port-channels like the VLT peer and Top of Rack (ToR), use the **port-channel** parameter on the ToR-side configuration to allow member ports of an ungrouped LACP port-channel to inherit vlan membership of that port channel to ensure untagged packets that are sent by a VLT peer device reach the DHCP server located on the ToR.

To ungroup the VLT and port-channel configurations, use the **no lacp ungroup member independent** command on a VLT port channel, depending on whether the port channel is VLT or non-VLT.

Example

```
Dell(conf)#lacp ungroup member-independent ?
port-channel                 LACP port-channel members become
switchports
vlt                                    All VLT LACP members
become switchports
```

peer-link port-channel

Configure the specified port channel as the chassis interconnect trunk between VLT peers in the domain.

Syntax

```
peer-link port-channel port-channel-number {peer-down-vlan vlan id}
```

Parameters

port-channel-number	Enter the port-channel number that acts as the interconnect trunk.
peer-down-vlan *vlan id*	Enter the keyword `peer-down-vlan` then a VLAN ID to configure the VLAN that the VLT peer link uses when the VLT peer is down.

Defaults Not configured.

Command Modes VLT DOMAIN

Command History This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 9.0.2.0	Introduced on the S6000.
Version 9.0.0.0	Introduced on the Z9000.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.12.0	Added support for the **peer-down-vlan** parameter.
Version 8.3.8.0	Introduced on the S4810.

Usage Information

To configure the VLAN from where the VLT peer forwards packets received over the VLTi from an adjacent VLT peer that is down, use the **peer-down-vlan** parameter. When a VLT peer with bare metal provisioning (BMP) is booting up, it sends untagged DHCP discover packets to its peer over the VLTi. To ensure that the DHCP discover packets are forwarded to the VLAN that has the DHCP server, use this configuration.

show vlt mismatch

Display mismatches in VLT parameters.

Syntax

```
show vlt mismatch
```

Command Modes

EXEC

Command History

This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 9.2(0.2)	Introduced on the Z9000, S4810, and S4820T.

Example

```
Dell#show vlt mismatch
Domain
-----------
Parameters        Local              Peer
------------     -----------       ---------
    Unit-ID       0                   15

Vlan-config
------------
Vlan-ID      Local Mode     Peer Mode
---------   ------------ -----------

     100              --                  L3

Vlan IPV4 Multicast Status
--------------------------
```

```
  Vlan-ID       Local Status       Peer Status
  --------      ------------       -----------

  4094               Active              Inactive

Dell#
```

system-mac

Reconfigure the default MAC address for the domain.

Syntax `system-mac mac-address`

Parameters

mac-address	Enter the system MAC address for the VLT domain.

Defaults Not configured.

Command Modes VLT DOMAIN

Command History This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 9.0.0.0	Introduced on the Z9000.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.8.0	Introduced on the S4810.

Usage Information When you create a VLT domain on a switch, Dell Networking OS automatically creates a VLT-system MAC address used for internal system operations.

To reconfigure the default MAC address for the domain by entering a new MAC address in the format nn:nn:nn:nn:nn:nn, use the `system-mac` command.

You must also reconfigure the same MAC address on the VLT peer switch.

unit-id

Explicitly configure the default unit ID of a VLT peer switch.

Syntax `unit-id [0 | 1]`

Parameters

0 | 1	Configure the default unit ID of a VLT peer switch. Enter `0` for the first peer or enter `1` for the second peer.

Defaults Automatically assigned based on the MAC address of each VLT peer. The peer with the lower MAC address is assigned unit 0; the peer with the higher MAC address is assigned unit 1.

Command Modes VLT DOMAIN

Command History This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 9.0.2.0	Introduced on the S6000.
Version 9.0.0.0	Introduced on the Z9000.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.8.0	Introduced on the S4810.

Usage Information When you create a VLT domain on a switch, Dell Networking OS automatically assigns a unique unit ID (0 or 1) to each peer switch. The unit IDs are used for internal system operations. Use the `unit-id` command to explicitly configure the unit ID of a VLT peer. Configure a different unit ID (0 or 1) on each peer switch.

To minimize the time required for the VLT system to determine the unit ID assigned to each peer switch when one peer reboots, use this command.

vlt domain

Enable VLT on a switch, configure a VLT domain, and enter VLT-domain configuration mode.

Syntax `vlt domain` *`domain-id`*

Parameters

domain-id	Enter the Domain ID number. Configure the same domain ID on the peer switch. The range of domain IDs is from 1 to 1000.

Command Modes CONFIGURATION

Command History This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.

Version 9.0.2.0	Introduced on the S6000.
Version 9.0.0.0	Introduced on the Z9000.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.8.0	Introduced on the S4810.

Usage Information The VLT domain ID must be the same between the two VLT devices. If the domain ID is not the same, a syslog message is generated and VLT does not launch.

Related Commands show vlt brief — uses the `show vlt brief` command to display the delay-restore value.

vlt-peer-lag port-channel

Associate the port channel to the corresponding port channel in the VLT peer for the VLT connection to an attached device.

Syntax `vlt-peer-lag port-channel` *`id-number`*

Parameters

id-number	Enter the respective vlt port-channel number of the peer device.

Defaults Not configured.

Command Modes INTERFACE PORT-CHANNEL

Command History This guide is platform-specific. For command information about other platforms, refer to the relevant *Dell Networking OS Command Line Reference Guide*.

The following is a list of the Dell Networking OS version history for this command.

Version 9.2(0.0)	Introduced on the M I/O Aggregator. This command is supported in Programmable-Mux (PMUX) mode only.
Version 9.0.2.0	Introduced on the S6000.
Version 9.0.0.0	Introduced on the Z9000.
Version 8.3.19.0	Introduced on the S4820T.
Version 8.3.8.0	Introduced on the S4810.

A

Internet Control Message Protocol (ICMP) Message Types

This chapter lists and describes the possible ICMP message type resulting from a ping. The first three columns list the possible symbol or type/code. For example, you would receive a ! or 03 as an echo reply from your ping.

Table 1. ICMP Messages and Their Definitions

Symbol	Type	Code	Description	Query	Error
.			Timeout (no reply)		
!	0	3	echo reply	.	
U	3		destination unreachable:		
		0	network unreachable		.
		1	host unreachable		.
		2	protocol unreachable		.
		3	port unreachable		.
		4	fragmentation needed but don't fragment bit set		.
		5	source route failed		.
		6	destination network unknown		.
		7	destination host unknown		.
		8	source host isolated (obsolete)		.
		9	destination network administratively prohibited		.
		10	destination host administratively prohibited		.
		11	network unreachable for TOS		.
		12	host unreachable for TOS		.
		13	communication administratively prohibited by filtering		.
		14	host precedence violation		.
		15	precedence cutoff in effect		.
C	4	0	source quench		.
	5		redirect		.

Symbol	Type	Code	Description	Query	Error
		0	redirect for network		.
		1	redirect for host		.
		2	redirect for type-of-service and network		.
		3	redirect for type-of-service and host		.
	8	0	echo request	.	
	9	0	router advertisement	.	
	10	0	router solicitation	.	
&	11		time exceeded:		
		0	time-to-live equals 0 during transit		.
		1	time-to-live equals 0 during reassembly		.
	12		parameter problem:		
		1	IP header bad (catchall error)		.
		2	required option missing		.
	13	0	timestamp request	.	
	14	0	timestamp reply	.	
	15	0	information request (obsolete)	.	
	16	0	information reply (obsolete)	.	
	17	0	address mask request	.	
	18	0	address mask reply	.	